

AMENDED APPLICATION

W-01445A-10-0517

PART 5 OF 5 BAR CODE # 0000125118

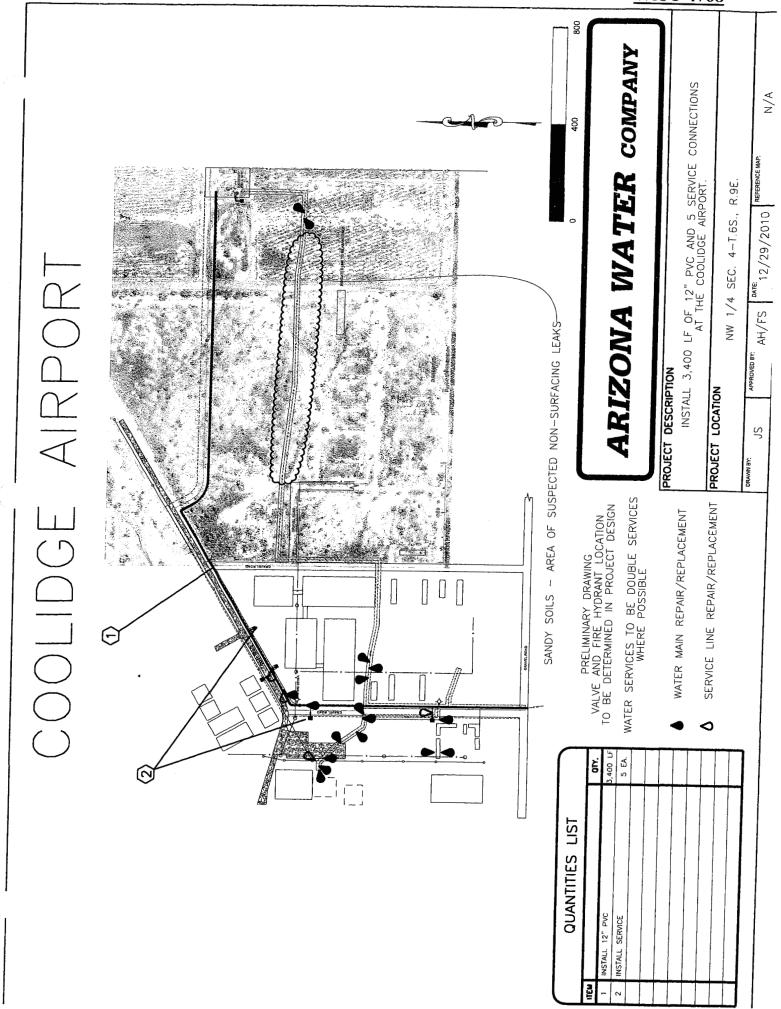
To review remaining parts please see the following:

PART 1 OF 5 BAR CODED #0000125114

PART 2 OF 5 BAR CODED #0000125115

PART 3 OF 5 BAR CODED #0000125116

PART 4 OF 5 BAR CODED #0000125117



Coolidge Airport

LEAK LOCATION	SECTION	DATE	TYPE
3644 S Hanger Drive	NW 1/4 Sec 4 T6S R9E	2009	Service Replacement
3644 S Hanger Drive	NW 1/4 Sec 4 T6S R9E	2010	Main Repair
3644 S Hanger Drive	NW 1/4 Sec 4 T6S R9E	2010	Main Repair
3644 S Hanger Drive	NW 1/4 Sec 4 T6S R9E	2010	Main Repair
6300 N Airport Road	NW 1/4 Sec 4 T6S R9E	2010	Service Replacement
6300 N Airport Road	NW 1/4 Sec 4 T6S R9E	2010	Main Repair
6300 N Airport Road	NW 1/4 Sec 4 T6S R9E	2010	Main Repair
6300 N Airport Road (Office)	NW 1/4 Sec 4 T6S R9E	2010	Main Repair
6300 N Airport Road (Office)	NW 1/4 Sec 4 T6S R9E	2009	Main Repair
6300 N Airport Road (Office)	NW 1/4 Sec 4 T6S R9E	2009	Main Repair
6300 N Airport Road (Office)	NW 1/4 Sec 4 T6S R9E	2010	Main Repair
6300 N Airport Road (Office)	NW 1/4 Sec 4 T6S R9E	2009	Main Repair
9300 N Airport Road	NW 1/4 Sec 4 T6S R9E	2009	Service Repair
South of 6300 N Airport Road	NW 1/4 Sec 4 T6S R9E	2010	Main Repair
South of 6300 N Airport Road	NW 1/4 Sec 4 T6S R9E	2010	Main Repair
South of 6300 N Airport Road	NW 1/4 Sec 4 T6S R9E	2010	Main Repair
South of Airport Road	NW 1/4 Sec 4 T6S R9E	2010	Main Repair
South of Airport Road	NW 1/4 Sec 4 T6S R9E	2010	Main Repair
South of Airport Road	NW 1/4 Sec 4 T6S R9E	2010	Main Repair
Southwest of North Well Yard	NW 1/4 Sec 4 T6S R9E	2010	Main Repair
Southwest of North Well Yard	NW 1/4 Sec 4 T6S R9E	2010	Service Repair

WORK AUTHORIZATION

W.A. NUMBER:
P.E. NUMBER:
BUDGET ITEM NO.:

SHEET NO .:

Special #23

1-4768

AUTHORIZATION

PINAL VALLEY

PINAL VALLEY
2100 WORK TO ST

WORK TO START BY:
WORK TO BE FINISHED BY:

UPON AUTHORIZATION WITHIN 85 DAYS

DESCRIPTION OF WORK:

SYSTEM:

DIVISION:

TAX CODE:

Coolidge Airport Main Replacement project: Replace approximately 3,680 If of 6-inch PVC pipe with 3,300 If of 12-inch C-900 PVC. Construct in accordance with attached drawings and/or Arizona Water Company specifications.

FACTORS JUSTIFYING WORK:

The Company has experienced several leaks on these waterlines due to age of the pipe and sandy soil making leaks hard to find and contributing to increasing water loss in the Coolidge system, Specifically the Coolidge Amount.

COST ESTIMATE		AUTHORIZATION	DATE	
COST OF WORK:			James Wilson gw 10/27/10	10/22/10
MATERIAL		0 158	REVIEWED FOR ESMT/ROW VERIFICATION:	
LABOR	· 	9,155	(GBi	10-22-2010
CONTRACT PORTION		199,400	Charles Briggs CB 10-28-2010	
OVERHEAD TOTAL AUTHORIZED EXPENDITURES		50,053	REVIÈWED BY:	10-22-10
CHARGEABLE TO THIS W.A.	\$	258,608	Mike Loggins ML 10-28-10	<u>'</u>
FUNDS RECEIVED: CONTRIBUTIONS RECEIVED		0	APPROVED BY ENGINEERING: GUILLIA IC I IIIIIIIIIIIIIIIIIIIIIIIIIIIII	10-22-10
REFUNDABLE ADVANCES RECEIVED		0	APPROVED BY FINANCE:	10/22/10
TOTAL CONTRIBUTIONS/ADVANCES		0	Joseph Harris	10/24/10
NET CASH REQUIRED	\$	258,608	SPECIAL ITEM EXCEEDING \$10,000; AUTHORIZED BY PRESIDENT:	10-22-10
COMMENTS:			William Garfield	
•			SPECIAL ITEM EXCEEDING \$10,000; AUTHORIZED BY CHAIRMAN: APPROVED VIA FAX M. L. Whitehead	10/27/2010
			RELEASED CONSTRUCT CONSTRUCT Authorized by FRED, SCHN Date	ION

W.A. NUMBER:

1-4768

P.E. NUMBER:

BUDGET ITEM NO.:

Special #23

WORK AUTHORIZATION - DETAIL SHEET

SHEET NO.: 2 of 2 PLANT PROPERTY ACCOUNT YEAR INSTALLED AND W.A. NUMBER RETIREMENT 343 6-inch CA pipe 3680 1935 PROPERTY UNITS PROJECT DESCRIPTION Coolidge Airport Main Replacement project: Replace approximately 3,680 lf of 6-inch PVC pipe with 3,300 lf of 12-inch C-900 PVC. DESCRIPTION PLANT PROP ACCT QUANTITY UNIT COST 12" C-900 PVC w/ all related fittings 50.00 343 3,300 \$ 165,000 Tie into existing 6" PVC with 6" TS&V 343 2 2,700.00 5,400 7 Tie over existing services to new main 345 3,500.00 24,500 Replace existing 6" fire hydrant assembly 348 1 4,500.00 O 4,500 Ν Т R Α С Τ W 0 R 345 SERVICE CONNECTIONS COMPLETE: DOUBLE-LONG 345 SERVICE CONNECTIONS COMPLETE: DOUBLE-SHORT SERVICE CONNECTIONS COMPLETE: SINGLE-LONG 345 SERVICE CONNECTIONS COMPLETE: SINGLE-SHORT 345 TOTAL CONTRACT WORK 199,400 Α T E 345 SERVICE CONNECTIONS: DOUBLE-LONG 345 SERVICE CONNECTIONS: DOUBLE-SHORT SERVICE CONNECTIONS: SINGLE-LONG 345 L SERVICE CONNECTIONS: SINGLE-SHORT 345 346 METERS TOTAL MATERIALS 343 1,000.00 1,000 TESTING FEE 343 В PERMIT FEE 1 1,500.00 1,500 0 343 1 4,500.00 4,500 SURVEY FEE 343 2,155.00 2,155 FIELD INSPECTION 345 INSTALL SERVICE CONNECTIONS: DOUBLE-LONG INSTALL SERVICE CONNECTIONS: DOUBLE-SHORT 345 345 INSTALL SERVICE CONNECTIONS: SINGLE-LONG INSTALL SERVICE CONNECTIONS: SINGLE-SHORT 345 TOTAL LABOR \$ 9,155 SUBTOTAL - CONTRACT WORK, MATERIALS, AND LABOR 208,555

NON-REFUNDABLE PORTION

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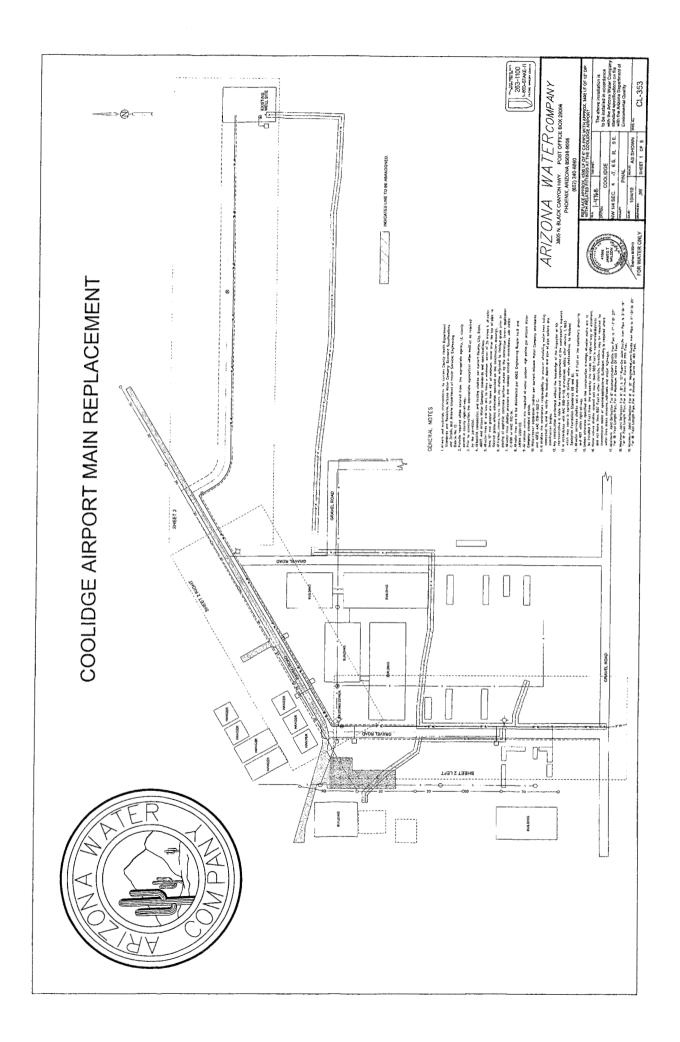
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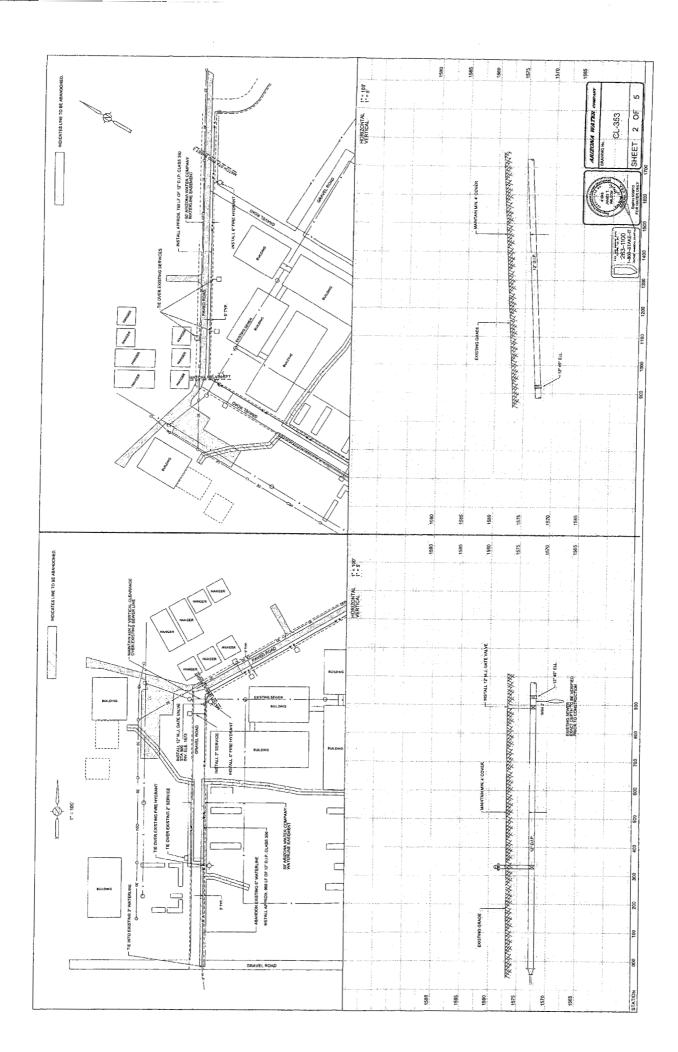
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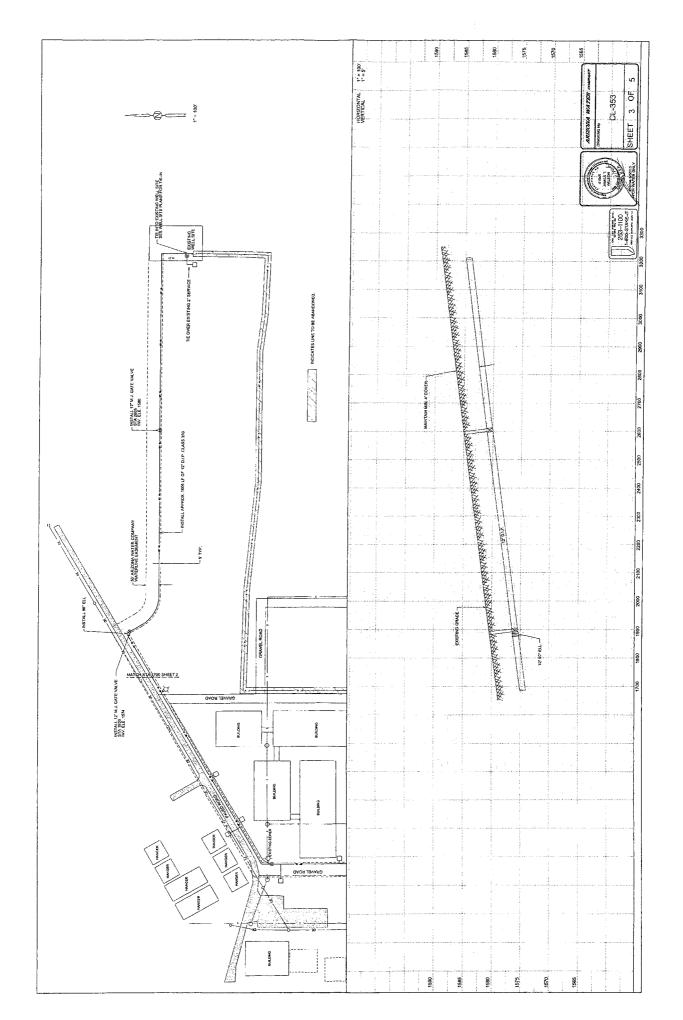
COST ESTIMATE

50,053 258,608

REFUNDABLE PORTION







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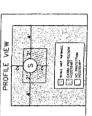
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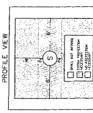
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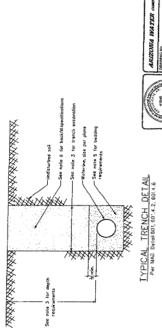
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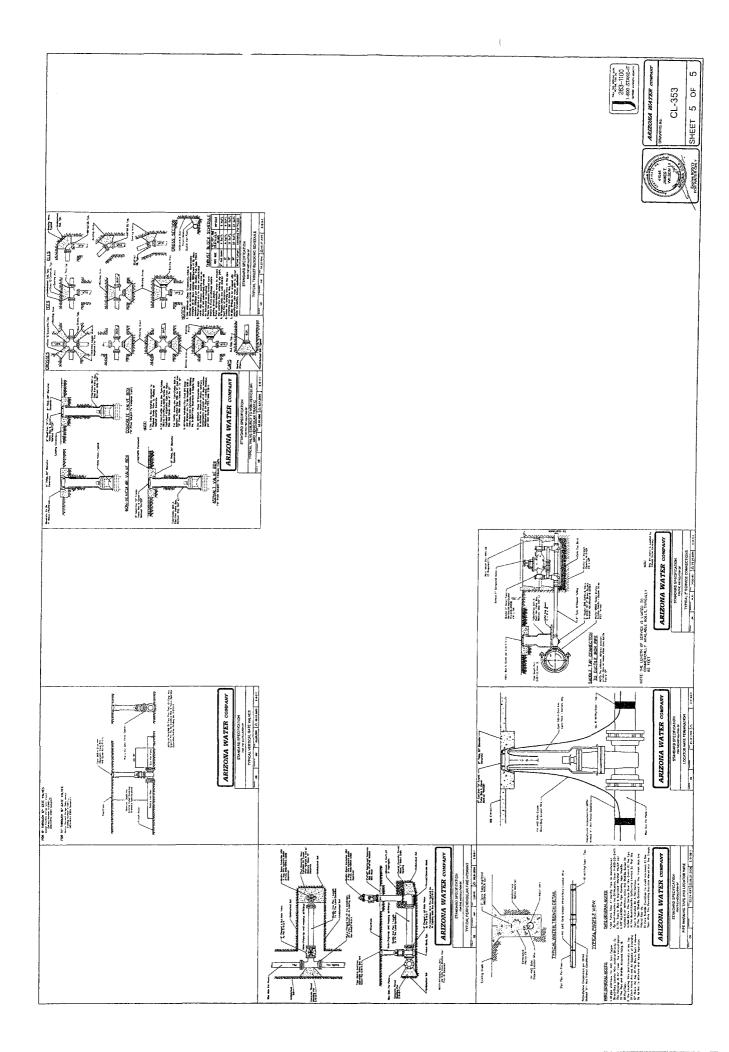
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FOR WATER ONLY 263-1100 1-800-STAKE-IT

CL-353

SHEET 4 OF



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ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY CERTIFICATE OF APPROVAL TO CONSTRUCT WATER FACILITIES

Page 1 Of 3

ADEO File No: 20100203

LTF No: 53319

System Name: Az Water Co-Coolidge

11-014 **System Number:**

Project Owner: Arizona Water Company

Address: POBox 29006, Phoenix, AZ 85038

Project Location: Coolidge

County: Pinal

Description: ARIZONA WATER COMPANY-COOLIDGE AIRPORT WATERMAIN EXTENSION. ATC PERMIT TO CONSTRUCT APPROXIMATELY 3,400

LF OF 12-INCH DIP WATERLINE AND RELATED FITTINGS. TO REPLACE APPROXIMATELY 4,500 LF OF EXISTING 6-INCH CA

PIPE.

Approval to construct the above-described facilities as represented in the approved documents on file with the Arizona Department of Environmental Quality is hereby given subject to provisions 1 through 7 continued on page 2 through 3

- This project must be constructed in accordance with all applicable laws, including Title 49, Chapter 2, Article 9 of the Arizona Revised Statutes and Title 18, Chapter 5, Article 5 of the Arizona Administrative Code.
- 2. Upon completion of construction, the engineer shall fill out the Engineer's Certificate of Completion and forward it to the Central Regional Office located in Phoenix. If all requirements have been completed, that unit will issue a Certificate of Approval of Construction. R18-5-507(B), Ariz. Admin.Code. At the project owner's request, the Department may conduct the final inspection required pursuant to R18-5-507(B); such a request must be made in writing in accordance with the time requirements of R18-5-507(C), Ariz. Admin. Code.
- 3. This certificate will be void if construction has not started within one year after the Certificate of Approval to Construct is issued, there is a halt in construction of more than one year, or construction is not completed within three years of the approval date. Upon receipt of a written request for an extension of time, the Department may grant an extension of time; an extension of time must be in writing. R18-5-505(E), Ariz. Admin. Code.
- 4. Operation of a newly constructed facility shall not begin until a Certificate of Approval of Construction has been issued by the Department. R18-5-507(A), Ariz. Admin. Code.

Reviewed by: FMS

Janak K. Desai, P.E. Unit Manager

Engineering Review Section Water Quality Division

cc: File No: 20100203 Regional Office: Central Owner: Arizona Water Company County Health Department: Engineer: Arizona Water Company Planning and Zoning/Az Corp. Commission Engineering Review Database - Etr021

APPROVAL TO CONSTRUCT POTABLE WATERLINE ADEQ FILE No. 20100203 PAGE 2 OF 3: PROVISIONS CONTINUED

5. Approval of Construction (AOC) will not be issued until data is obtained and verified for Pressure and Leakage Testing and Disinfection Sampling of all potable water lines. Engineering Bulletin No. 10, Chapter 2.E.20, Disinfection Requirements; requires that..."Every new, modified or reconditioned groundwater source shall be disinfected after placement of final pump equipment". Information on disinfection procedures can be obtained from "Engineering Bulletin No. 8, "Disinfection of Water Systems".

It is recommended that the Engineer's Certificate of Completion (ECC) Data Required Sheet be completed in full, showing actual pressures and sampling data. Data required with ECC sheet can be found under heading - Safe Drinking Water and subheading - Technical Engineering/Plan Reviews

http://www.azdeq.gov/function/forms/appswater.html#sdw.

- 6. Before construction of a modification, expansion, or alteration of this distribution system begins, a separate Approval to Construct applicable to each addition must be obtained. A.A.C. R18-5-505(B).
- 7. The Arizona Department of Environmental Quality's review of this application was subject to the requirements of the licensing time frames ("LTF") statute under Arizona Revised Statutes ("A.R.S.") § 41-1072 through § 41-1079 and the LTF rules under Arizona Administrative Code ("A.A.C.") R18-1-501 through R18-1-525. This Notice is being issued within the overall time frame for your application.

ADEQ hereby approves your application for Approve to Construct Drinking Water Facilities under A.R.S. § 49-351. Your copy is enclosed.

This decision is an appealable agency action under A.R.S. § 41-1092. You have a right to request a hearing and file an appeal under A.R.S. § 41-1092.03(B). You must file a written Request for Hearing or Notice of Appeal within **30 days** of your receipt of this Notice. A Request for Hearing or Notice of Appeal is filed when it is received by ADEQ's Hearing Administrator as follows:

Office of Administrative Counsel Arizona Department of Environmental Quality 1110 W. Washington Street Phoenix, AZ 85007 APPROVAL TO CONSTRUCT POTABLE WATERLINE ADEQ FILE No. 20100203 PAGE 3 OF 3: PROVISIONS CONTINUED

The Request for Hearing or Notice of Appeal shall identify the party, the party's address, the agency and the action being appealed and shall contain a concise statement of the reasons for the appeal. Upon proper filing of a Request for Hearing or Notice of Appeal, ADEQ will serve a Notice of Hearing on all parties to the appeal. If you file a timely Request for Hearing or Notice of Appeal you have a right to request an informal settlement conference with ADEQ under A.R.S. § 41-1092.06. This request must be made in writing no later than **20 days** before a scheduled hearing and must be filed with the Hearing Administrator at the above address.

Please contact Frank M. Smaila at (602) 771-4237 or fms@azdeq.gov if you have questions regarding this Notice or the Certificate of Approved to Construct.



OFFICIAL RECORDS OF PINAL COUNTY RECORDER LAURA DEAN-LYTLE

DATE/TIME:

11/29/2010 1416

FEE:

\$11.00

PAGES:

3

FEE NUMBER:

2010-110981





When recorded return to:

Norma Ortiz, City Clerk City of Coolidge 130 W. Central Avenue Coolidge, Arizona 85128

GRANT OF EASEMENT

This Agreement made and entered into this 22nd day of November, 2010, by and between the City of Coolidge ("Grantor"), an Arizona municipal corporation, and the Arizona Water Company, an Arizona corporation ("Grantee").

Recording Requested By: ARIZONA WATER COMPANY

When Recorded, Mail To: Arizona Water Company P.O. Box 29006 Phoenix, Arizona 85038-9006

ABOVE SPACE RESERVED FOR COUNTY RECORDER

GRANT OF EASEMENT CITY OF COOLIDGE,

an Arizona municipal corporation, organized under the laws of the State of Arizona (hereinafter referred to as "Grantor"), for a valuable consideration, receipt of which is hereby acknowledged, grants to ARIZONA WATER COMPANY, an Arizona corporation, its successors and assigns (hereinafter referred to as "Grantee"), a perpetual non-exclusive easement and the right to excavate for, install, operate, maintain, remove or replace one or more pipelines, including valves, hydrants, meters and other equipment and appurtenances, for the purpose of conveying water for domestic use, fire protection and irrigation, ingress and egress, or other purposes, and to use the same for such purposes, on that certain real property in the County of Pinal, State of Arizona, described as follows:

A parcel of land as described in Docket 225, Page 106, records of Pinal County, Arizona, lying within and being a part of Sections 4 and 5, Township 6 South, Range 9 East of the Gila and Salt River Base and Meridian, Pinal County, Arizona, described as follows:

Lots 1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, and 14; The South half of the Northeast quarter; The South half of the Northwest quarter; The Southwest quarter; The North half of the Southeast quarter, all in said Section 4;

Lots 7, 8, 9, and 10; The South half of the Northeast quarter; The North half of the Southeast quarter, all in said Section 5.

EASEMENT DESCRIPTION

An easement 50.00 feet wide, lying 25.00 feet on each side of the following described centerline, lying within and being a part of Section 4, Township 6 South, Range 9 East of the Gila and Salt River Base and Meridian, Pinal County, Arizona, said easement centerline being more particularly described as follows:

COMMENCING at the Northeast corner of said Section 4, from which the North quarter corner of said Section 4 bears N89°29'07"W, a distance of 2642.22 feet;

Thence S03°46'21"W, a distance of 2117.74 feet to the POINT OF BEGINNING;

Thence S89°56'23"W, a distance of 1392.28 feet to a point of curvature;

Thence Northwesterly along the arc of said curve, concaved to the Northeast, having a radius of 100.00 feet, through a central angle of 59°59'40", with an arc length of 104.71 feet;

Thence N30°04'06"W, a distance of 77.52 feet to a point on the centerline of Aviation Avenue;

Thence S60°01'59"W, along the centerline of Aviation Avenue a distance of 969.80 feet;

Thence S00°01'10"W, a distance of 1578.66 feet to the POINT OF TERMINUS.

GRANTOR agrees for itself, its successors and assigns that no building or other structure will be constructed, or other obstruction placed, over this easement or over any facilities of Grantee; provided, however, that with Grantee's prior consent, Grantor may build over this easement after first paying to Grantee the cost of relocating the facilities and granting an alternative easement satisfactory to Grantee and without additional cost to Grantee.

GRANTEE, its agents and employees, shall at all times have the right of unobstructed ingress to and egress from said Real Property, and free access to said water system facilities pipelines, equipment and appurtenances for the purpose of maintaining, operating, removing or replacing same including the right to trim or remove any trees or shrubs that in Grantee's judgment interfere with the rights herein granted. Grantee agrees to use reasonable care to avoid damage to the property of Grantor in the exercise of this easement.

The individual signing this Agreement warrant that they have read this Agreement, have the authority to execute this Agreement, and will furnish such evidence reasonably necessary to validate such authority upon request.

EXECUTED this 22 day of November, year of 2010.

CITY OF COOLIDGE

	By: Robert F. Flithy
	Title: City Manager
ATE OF ARIZONA)	8

STATE OF HRIZONA)

SS

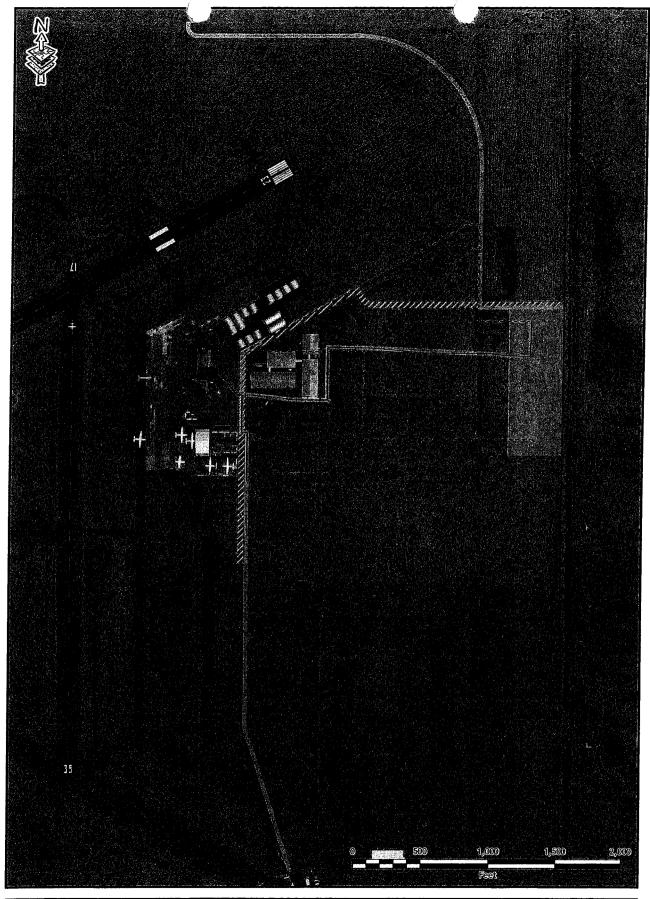
COUNTY OF PINAL

This foregoing instrument was acknowledged before me this 22ⁿ day of November in the year 2010 by Robert F. FLATKEY, CITY MANAGER, of the City of Coolidge, an Arizona municipal corporation, on behalf of the corporation.

My Commission Expires: NORMA C. ORTZ
NOTARY PUBLIC - ARIZONA

PINAL COUNTY
My Commission Expires
August 21, 2014

JJW





Arizona Water Company Easements @ Coolidge Airport

Active Water Lines (per Blue Stake) Existing AZ Water Company Easements

Inactive Water Lines (per As-builts) Mew Water Easement



Casa Grande Office: PO Box 11030 - Casa Grande, AZ 85130 -1030 Voice: 520-836-8785 Fax: 520-836-2850

PROPOSAL/CONTRACT

CONTRACTOR CENTRAL ARIZONA PIDELINE CONTRACTOR'S INC.	SYSTEM:	Coolidge Airport
	W.A. No(s):	
	BID DUE DATE:	October 22, 2010

CONTRACTOR SUBMITS this PROPOSAL/CONTRACT to ARIZONA WATER COMPANY, an Arizona corporation (the "Company"), to perform the work and complete the project described on Page 2 (the "Project"), as an independent prime contractor.

- Contractor certifies that it has a complete copy of, and has read, understands and accepts, the Company's General Conditions of Contract, and the Company's Construction 1. Specifications and Standard Specification Drawings. (the "Specifications") all of which are attached hereto. Contractor has examined the specific plans and related construction drawings for the Project (the "Drawings"), copies of which are also attached hereto. The General Conditions of Contract, Specifications and Drawings are incorporated into this Proposal/Contract. Contractor affirms that all work and materials to be furnished or purchased for the Project will be in strict conformance with the General Conditions of Contract, Specifications and Drawings
- Contractor represents and warrants that it has satisfied and complied with the provisions of Section 6, Contractor Understands Work and Working Conditions, of the General 2 Conditions of Contract prior to submitting this Proposal/Contract.
- Contractor represents that this Proposal/Contract is fair and honest in all respects, is submitted in good faith and is not submitted in collusion with any other company, entity or 3
- Contractor acknowledges that one hundred percent (100%) Performance and Payment Bonds are required and must be provided to the Company prior to the commencement of 4
- 5 Prior to the commencement of work, Contractor will submit to the Company a list of all materials to be used in the Project. The materials list will include the manufacturer, part number, price and quantity included in this Proposal/Contract.
- Contractor will furnish all labor, tools, equipment and materials required to complete the Project according to the General Conditions of Contract, Specifications and Drawings. No materials purchased by Contractor to be incorporated into the Project are subject to tax at the time of purchase and Contractor will not charge the Company for any such tax. Contractor will pay the applicable transaction privilege tax (the "Contracting Tax") on the Project after Contractor receives payment of the final Project invoice from the Company. The cost of materials incorporated into the Project which are exempt by Arizona Revised State Statues ("A.R.S.") from the Contracting Tax, for example, pipes or valves having a diameter of four (4) inches or larger, including equipment, fittings and any other related part that is used in operating the pipes or valves (A.R.S. §42-5061 B.6.), will not be included in the total cost of the labor and materials upon which the Contracting Tax is computed. Contractor retains full liability and obligation to pay the Contracting Tax and will defend and indemnify the Company against any demand or obligation to pay the Contracting Tax.
- Contractor will maintain detailed accounting records of all materials purchased and incorporated into the Project. Such records will include all supporting original vendor invoices 7. for all materials purchased. Following completion of the Project, Contractor will submit an itemized accounting to the Company which will include all supporting original vendor invoices and satisfactory evidence of payment thereof. The Company will not pay Contractor for materials not actually incorporated into the Project, and the disposition of such materials will remain Contractor's responsibility.
- The Estimated Total Cost of the Project, shown on Page 2, is based on estimated labor and material quantities to be furnished. It includes an estimate of the Contracting Tax and 8. the cost of the required Performance and Payment Bonds. Contractor will not cancel, modify or withdraw this Proposal/Contract during a ninety-day (90) period commencing on the Bid Due Date. The Company may accept this Proposal/Contract by signing and mailing, or otherwise delivering, a copy hereof to Contractor during such ninety-day (90) period. If the Company does not accept this Proposal/Contract during such ninety-day (90) period, Contractor may cancel this Proposal/Contract by giving written notice of cancellation to the
- Prior to the commencement of work, Contractor will provide the Company with a detailed construction schedule, in either Gantt or CPM form, identifying all tasks to be performed 9. from the date of the written Commencement Notice through completion of the Project, including testing, training of Company Personnel and final Project invoicing. Contractor will provide the Company with a copy of such construction schedule documenting the progress of work on the Project at least monthly.
- Contractor will not commence work on the Project until the Company gives Contractor a written Commencement Notice. Contractor will complete the Project within calendar days after the Commencement Notice is issued. 10. calendar days after the Commencement Notice is issued.
- Following the Company's written notice of satisfactory completion of the Project, and upon receipt of the final Project invoice from Contractor, the Company shall pay Contractor the 11. actual total cost of the Project, which will be calculated as shown on Page 2, except that actual labor and material quantities installed/constructed will be substituted for the estimated labor and materials quantities and the Contracting Tax will be recalculated based on such actual labor and materials quantities.
- The amount of applicable liquidated damages for Contractor's failure to deliver or perform within the time limit shown in Paragraph 10 may be deducted from the Company's payment of the final Project invoice. This provision shall not limit the Company's ability to terminate this Proposal/Contract for Contractor's unsatisfactory performance or failure to perform as provided in the General Conditions of Contract, Specifications or Drawings, or in this Proposal/Contract.

SPECIAL CONDITIONS:

NONE

CONTRACTOR	PROPOSAL/CONTRACT ACCEPTED:
CENTRALARIZONA PIDELINE CRUHANCIORS INC	ARIZONA WATER COMPANY
By: Chylon (white	By: Medica Lalina
Print Name: CLINTON White	Print Name: Roy Freeman FRODUCK K Schneider
Title: PRESIDENT	Title: Operations Superintendent Vf Engineering.
Date: (0/00) / 0	Date: 11-28-10
KGW /	





Casa Grande Office: PO Box 11030 - Casa Grande, AZ 85130 - 1030 Voice: 520-836-2850 Fax: 520-836-2850

PROPOSAL/CONTRACT

	SYSTEM:
CONTRACTOR: CENTRAL ARIZONA PIDELINE CONTRACTORS, INC.	Coolidge Airport
	W.A. No(s):
az contractor license no: ROC 164758 classification: K-80	
Do Day noo A. II he can	BID DUE DATE:
ADDRESS: DO BOX 336 (100), age, AZ 85128	October 22, 2010
	BID BOND REQUIRED
	X Yes No
DESCRIPTION Install approximately 3400 L.F of 12" Ductile Iron Pipe and tie over	existing services all

DESCRIPTION OF PROJECT:

Install approximately 3400 L.F of 12" Ductile Iron Pipe and tie over existing services all with related fittings in easements at Coolidge Airport in a portion of the of Sec 4 T.6S., R.9E.

		UN	T PRICE	TOTA	L COST
1-2. MATERIALS EXEMPT FROM CONTRACTING TAX (per Paragraph 6)	QUANTITY	LABOR	MATERIALS	_LABOR	MATERIALS
Tie 12" Ductile Iron Pipe to existing 8" pipe w/related fittings	1	581	500	581	500
Tie 12" Ductile Iron Pipe to existing 3" pipe w/related fittings	1	581	300	581	300
Install 12" Ductile Iron Pipe w/14ga locator wire and related fittings	3400 L.F	2.05	23.56	6970	80104
Install a 12"x6" MJxFL tee w/a 6" MJxFL GV and related fittings (FH)	2	145	909	240	1818
Tie existing 6" FH to 6" MJxFL GV w/related fittings	1	261	700	2/04	700
Install a 6" fire hydrant w/related fittings	1	387	2479	1 387	2 2474
Total Labor to Install Exempt Materials (add the amounts in column 1) Total Common Materials (add the amounts in column 2)				<u></u>	(3) (4)
Total Exempt Materials (add the amounts in column 2)		*** ** ** ** ** ** * * * * * * * * * * *			4 85901
5-6. NON-EXEMPT MATERIALS	QUANTITY	LABOR	MATERIALS	_LABOR	MATERIALS
nstall a short 1" copper service w/related fittings	2	41	500	182	1000
nstall a long 1" copper service w/related fittings	1	150	600	150	Loca
nstall a long 2" copper service w/related fittings	2	315	2584	540	K198
Tie new 2" service to existing customer line w/2" ball valve and rltd fittings		100	250	200	500
Fie new 1" service to existing long customer line w/1" ball valve and rltd fittings	2	200	500	400	1000
Fie new 1" service to existing customer line w/1" ball valve and rltd fittings	1	100	250	1 100	350
Total Labor to Install Non-Exempt Materials (add the amounts in column 5)			7	1633	
8. Total Non-Exempt Materials (add the amounts in column 6)				. • . τ <i>У J V I</i> .	\$8528
9. Subtotal A (add lines 3, 7 and 8)	,			9	\$19112
10. Contracting Tax Base (multiply the amount on line 9 by 0.65)				sialala	K 7000
				10714	اوا در
12. Contracting Tax (multiply the amount on line 10 by line 11)				· / () / / / / / / / / / / / / / / / / /	1336,4
					iol 40
14. 100% Performance and Payment Bonds Cost				14	3193
15. Estimated Total Cost (add lines 13 and 14)				15	109654.

NOTE: The Estimated Total Cost includes all labor and materials for backfill, pavement replacement, chip seal, and traffic control necessary for the Project.

CONSTRUCTION SPECIFICATIONS: E-8-1

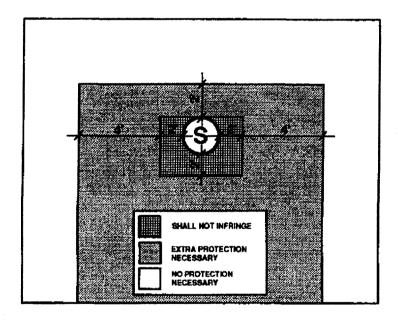
ERRATA 2010

10. PROTECTION OF WATER MAINS NEAR SEWERS

In order to protect water mains from contamination by sewers, the installation of the water mains must conform to the following requirements:

a. Horizontal - When water lines and sewers are laid parallel with each other, the horizontal distance between them shall not be less than six feet (6'). Each line shall be laid on undisturbed or bedded material in a separate trench. Where conditions prevent the minimum horizontal separation set forth above, extra protection will be required. Extra protection shall consist of constructing the sewer main with mechanical joint ductile iron pipe or with slip-joint ductile iron pipe if joint restraint is provided, or encasing both the water main and sewer main in concrete. See Detail E-9-30-1 and E-9-30-2

The Construction Drawings shall indicate the installation requirements. The drawings showing these exceptions shall have been approved by the appropriate state and/or county health department. Refer to the diagram below for clarification.



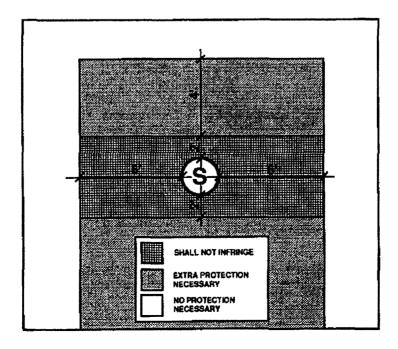
Under no circumstances will the horizontal separation between sewer mains and water mains be less than two feet (2'). All distances are to be measured from the outside of the sewer main to the outside of the water main.

b. Vertical - When a water main is parallel with or crosses a sewer main within two feet (2') above the sewer or greater than two feet (2') below the sewer, extra protection will be required. Extra protection shall consist of constructing the sewer main with mechanical joint ductile iron pipe or with slip-joint ductile iron pipe if joint restraint is provided, or encasing both the water main and sewer main in concrete. See Detail E-9-30-1 and E-9-30-2.

The Construction Drawings shall indicate the installation requirements. The drawings showing these exceptions shall have been approved by the appropriate state and/or county health department.

Under no circumstances will the vertical separation of a sewer main installed above a water main be less than two feet (2'). All distances are to be measured from the outside of the sewer main to the outside of the water main. Refer to the diagram above for clarification.

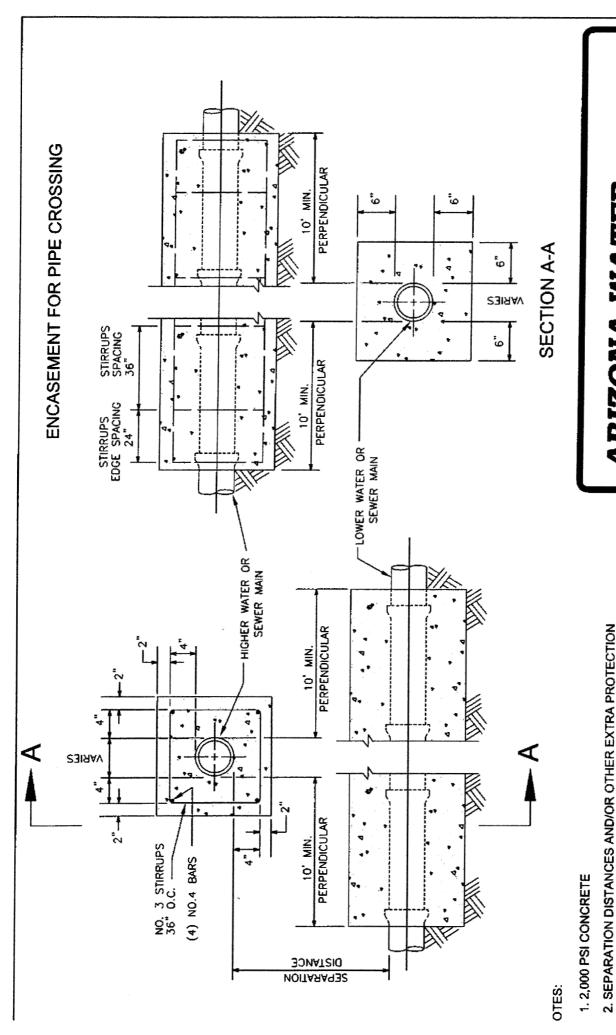
- c. When unusual conditions such as, but not limited to, highway or bridge crossings prevent the water and sewer main separations required from being met, the appropriate state and/or county health department will review and may approve requests for authorization to use alternate construction techniques, materials and joints on a case-by-case basis.
- d. No water pipe shall pass through or come into contact with any part of a sewer manhole. The minimum horizontal separation between water mains and manholes shall be six feet (6'), measured from the center of the manhole.
- e. The minimum separation between force mains or pressure sewers and water mains shall be two feet (2') vertically and six feet (6') horizontally under all conditions. Where a sewer force main crosses above, or less than six feet (6') below, a water line, the sewer main shall be encased in at least six inches (6") of concrete for ten feet (10') on either side of the water main. Refer to the diagram below for clarification.



STANDARD SPECIFICATION DRAWINGS: E-9-1

ERRATA 2010

E-9-20	INSTALLATION OF TYPICAL WELL WITH LINE SHAFT TURBINE PUMP
E-9-21	INSTALLATION OF TYPICAL WELL WITH SUBMERSIBLE TURBINE PUMP
E-9-22	INSTALLATION OF COLUMN PIPE, OIL TUBE AND LINE SHAFT
E-9-23	HOT TAP AND JUMPER METER CONNECTION
E-9-24	INSTALLATION OF TYPICAL WATER LINE ENCASEMENT
E-9-25	INSTALLATION OF CALCIUM HYPOCHLORITE TABLET CHLORINATOR
E-9-26	INSTALLATION OF CHAIN LINK FENCE
E-9-27	INSTALLATION OF SIDE HUNG WATER LINE SUSPENSION
E-9-28	PIPE WARNING TAPE, LOCATOR WIRE, AND LOCATOR WIRE TERMINATION
E-9-29	INSTALLATION OF A TYPICAL SAMPLING STATION
E-9-30-1	WATER AND SANITARY SEWER SEPARATION/PROTECTION PERPENDICULAR
E-9-30-2	WATER AND SANITARY SEWER SEPARATION/PROTECTION – PARALLEL



CONTAMINATION BY SANITARY SEWER MAINS. SEE AWC STANDARD

SPECIFICATION PAGES E-8-1-9 AND E-8-1-10.

SHALL BE REQUIRED TO PROTECT WATER MAINS FROM

PROTECTION. ALL DISTANCES ARE MEASURED PERPENDICULARLY 3. SEE CROSS SECTION DETAIL FOR LIMITS OF SEPARATION/EXTRA

FROM THE OUTSIDE OF THE PIPES.

4. RECLAIMED WATER SHALL BE CONSIDERED A SANITARY SEWER

WHEN PLACED NEXT TO A POTABLE WATER MAIN.

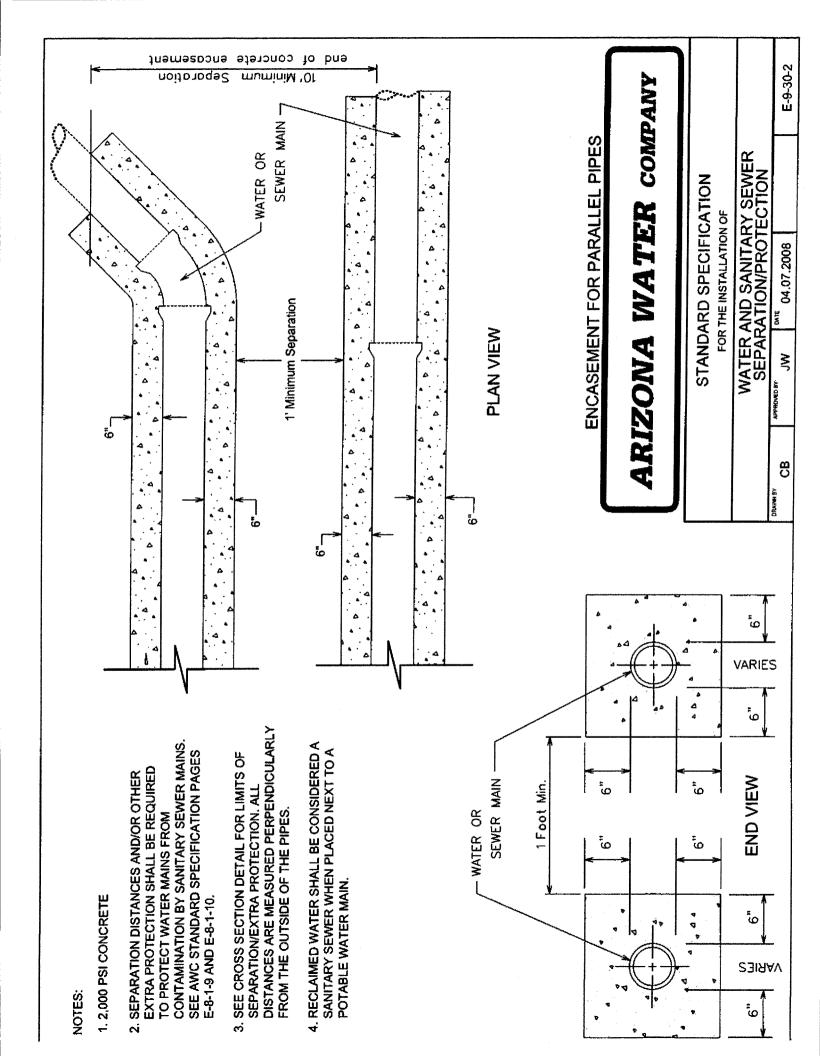
STANDARD SPECIFICATION FOR THE INSTALLATION OF

WATER AND SANITARY SEWER SEPARATION/PROTECTION

04.07.2008 ₹ 8

E-9-30-1

DRAWN BY



3805 N. BLACK CANYON HIGHWAY, PHOENIX, ARIZONA 85015-5351 • P.O. BOX 29006, PHOENIX, ARIZONA 85038-9006 PHONE: (602) 240-6860 • FAX: (602) 240-6878 • WWW.AZWATER.COM

October 19, 2010

Mr. Jim Ryan Clow Valve Company 8121 N. 10th Avenue Phoenix, Arizona 85021

Re: Clow Medallion Fire Hydrants and Resilient Wedge Gate Valves

Dear Mr. Ryan:

Thank you for your interest in working with Arizona Water Company (the "Company") to add Clow Medallion Fire Hydrants and Resilient Wedge Gate Valves to the Company's material and equipment specifications. Based on the Clow product information you provided and your field presentations to our operations and engineering staff, the Company is pleased to inform you that the following items are approved for use in the Company's water systems in Arizona.

Medallion Fire Hydrant:

- Model F-2545
 - 5¼" MVO
 - 4½" pumper
 - 2½" hose
 - Meets AWWA C-502 standard and approval by ULFM

Resilient Wedge Gate Valves:

- Model 2639 & 2640
 - Meets AWWA C-509 Full Body Cast Iron includes 304 SS Nuts, Bolts & Low Zinc Bronze Stem
 - Size range 2½" thru 12"
- Model 2638
 - Meets AWWA C-515 Reduced Wall Ductile Iron includes 304 SS Nuts, Bolts
 & Low Zinc Bronze Stem
 - Size range 14" thru 48"

To:

Jim Ryan - Clow Valve Company

October 19, 2010

Subject:

Clow Medallion Fire Hydrants and Resilient Wedge Gate Valves

Page 2

We look forward to developing a long-term relationship with you and the Clow products. If I can be of any assistance, please call me.

Very truly yours,

Luduca K Llust

Vice President - Engineering

lar

VIA EMAIL: JIM.RYAN@CLOWVALVE.COM

3805 N. BLACK CANYON HIGHWAY. PHOENIX. ARIZONA 85015-5351 • P.O. BOX 29006. PHOENIX. ARIZONA 85038-9006 PHONE: (602) 240-6860 • FAX: (602) 240-6878 • WWW.AZWATER.COM

November 24, 2010

Mr. Tony Geiger US Pipe – Waterworks Marketing Consultants 34522 N. Scottsdale Road Scottsdale, Arizona 85226

Re: US Pipe Sentinel Fire Hydrants and Resilient Wedge Gate Valves

Dear Mr. Geiger:

Thank you for your interest in working with Arizona Water Company (the "Company") to add US Pipe Sentinel Fire Hydrants and Resilient Wedge Gate Valves to the Company's material and equipment specifications. Based on the US Pipe product information you provided and your field presentations to our operations and engineering staff, the Company is pleased to inform you that the following items are approved for use in the Company's water systems in Arizona.

Sentinel Fire Hydrant:

- Model Sentinel 250
 - 5¼" MVO
 - 4½" pumper
 - 21/2" hose
 - Meets AWWA C-502 standard and approval by ULFM

Resilient Wedge Gate Valves:

- Model US Pipe A-USP0
 - Meets AWWA C-509 Full Body Cast Iron <u>includes</u> 304 SS Nuts, Bolts & Low Zinc Bronze Stem
 - Size range 2" thru 12"
- Model US Pipe A-USPI
 - Meets AWWA C-515 Reduced Wall Ductile Iron includes 304 SS Nuts, Bolts & Low Zinc Bronze Stem
 - Size range 14" thru 48"

To:

Tony Geiger - US Pipe

November 24, 2010

Subject:

US Pipe Sentinel Fire Hydrants and Resilient Wedge Gate Valves

Page 2

We look forward to developing a long-term relationship with you and the US Pipe products. If I can be of any assistance, please call me.

Very truly yours,

Fredrick K. Schneider

Vice President - Engineering

uduca & Slund

afh

VIA EMAIL: TGEIGER4@COX.NET



SPECIFICATIONS

GENERAL CONDITIONS OF CONTRACT: E-4-1

CONSTRUCTION SPECIFICATIONS: E-8-1

STANDARD SPECIFICATION DRAWINGS: E-9-1

GENERAL CONDITIONS OF CONTRACT: E-4-1

F-4-1

GENERAL CONDITIONS OF CONTRACT

DEFINITIONS

- A. <u>Company</u>. The words "Company" or "Arizona Water Company" mean Arizona Water Company, and where applicable, any division of Arizona Water Company, whose principal place of business is located at 3805 North Black Canyon Highway, Phoenix, Arizona 85015-5351 (Post Office Box 29006, Phoenix, Arizona 85038-9006).
- B. <u>Company's Authorized Representative</u>. The words "Company's Authorized Representative" mean any officer of the Company, and any of the Company's Engineers, any Division Manager or Superintendent of the Company and/or such other person(s) designated in writing as the "Company's Authorized Representative" by the President or any Vice President of the Company.
- C. <u>Contractor</u>. The word "Contractor" means either an individual or other entity employed to do the work as shown on the Construction Drawings and as specified herein.
- D. <u>Construction Drawings</u>. The words "Construction Drawings" mean plans prepared by or on behalf of Arizona Water Company.
- E. <u>Invitation to Bid</u>. The term "Invitation to Bid" means the current copy of Arizona Water Company's Form E-3-11-4 Request for Proposal/Contract or Form E-3-12-2 Invitation to Bid.
- F. <u>Contract</u>. The word "Contract" means the written document titled "Contract" or "Proposal/Contract" when such document has been signed by an officer or other authorized representative of both the Contractor and the Company.
- G. <u>Inspector</u>. The word "Inspector" means the Company's Authorized Representative or a person designated in writing by the Company's Authorized Representative.

GENERAL CONDITIONS OF CONTRACT

1. GENERAL

These General Conditions of Contract govern all works of installation and construction unless deviations are provided for on the Construction Drawings or in the Contract.

2. BONDS

The Contractor shall, upon request by the Company, furnish a performance bond and a material payment bond in the amount of 100% of the Contract price, in a form and from a surety acceptable to the Company.

3. LABOR AND/OR MATERIAL RELEASES

The Contractor shall supply labor and/or material releases satisfactory to the Company when requested to do so. Forms will be provided by the Company.

4. LICENSE

The Contractor shall have, as may be required by law, a valid license applicable to the work to be performed.

5. INSURANCE

The Contractor shall maintain in full force and effect insurance at no less than the following minimum amounts:

WORKER'S COMPENSATION	In accordance with requirements of the laws of the State of Arizona.
COMPREHENSIVE GENERAL LIABILITY (Including contractual liability covering death, bodily injury and property damage)	Combined single limit of not less than \$1,000,000 for each occurrence.
AUTOMOTIVE LIABILITY (Including owned, non-owned and hired vehicles)	Combined single limit of not less than \$1,000,000 for each occurrence.
SUBCONTRACTOR'S PUBLIC LIABILITY AND PROPERTY DAMAGE INSURANCE AND VEHICLE LIABILITY INSURANCE	Contractor shall either require each of its subcontractors to procure and to maintain Subcontractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance of the type and in the amounts specified in this Section 5 or insure the activities of its subcontractors in Contractor's own policy, in like amounts.

Such insurance shall name the Company, its officers, agents, and employees as additional insured and be primary for all purposes.

The Company will at all times have the right to require that all of such insurance be placed with insurance companies that are satisfactory to it. The Contractor shall file with the Company a certificate evidencing that each policy of insurance for the above coverages in the minimum amounts specified has been purchased and is in good standing.

Such certificate shall provide that notice be given to the Company at least thirty (30) days prior to cancellation or material change in the form of such policies or any of them. Such certificates shall be kept on file by the Company and the Company must have current certificates on file, or a certificate must accompany any bid proposal, before that proposal will be accepted by the Company.

6. CONTRACTOR UNDERSTANDS WORK AND WORKING CONDITIONS

By executing a Contract with the Company, the Contractor warrants that it has, by careful examination, satisfied itself as to the nature and location of the work, including soil conditions, the character, quality and quantity of the materials to be encountered, the character of the equipment and facilities needed preliminary to and during prosecution of the work, the general and local conditions, and all other matters which can in any way be expected to affect its work under the Contract. Verbal agreements or conversations with any officer, agent or employee of the Company, either before or after the execution of the Contract, are not binding upon the Company and shall not affect or modify any of the terms or obligations herein contained.

7. SPECIFICATIONS AND DRAWINGS

The Contractor shall keep on the job a complete copy of all drawings and specifications furnished by the Company which are applicable to the Contract with the Company. Anything mentioned in the specifications and not shown on the drawings or shown on the drawings and not mentioned in the specifications shall be of like effect as if shown or mentioned in both. In case of a discrepancy between the figures, drawings or specifications and physical conditions of the job, the matter shall be immediately submitted to the Company's Authorized Representative for decision as to adjustments, if any, because of the discrepancy; without a decision from the Company's Authorized Representative no discrepancy shall be adjusted by the Contractor, save only at its own risk and expense. Any deviation from the specifications must be approved in writing by the Company's Authorized Representative.

8. PROPERTY PROTECTION

Trees, fences, poles, underground structures and all other property shall be protected unless their removal is authorized on the Construction Drawings. Any property damaged shall be restored by the Contractor, at its expense, to the owner's satisfaction.

9. SPECIAL PERMITS, LICENSES AND INSURANCE

The Company shall obtain all permits for railroad, county, state, city and irrigation district rights-of-way as well as Forest Service, State Land Department and Bureau of Land Management permits. (Pipeline Contractors)

Whenever blasting is required, the Contractor shall obtain all permits, licenses and insurance required at its expense. (All Contractors)

The Contractor will be required to obtain, and shall certify in writing to the Company that it has obtained, all additional permits required to perform the work including, but not limited to, a National Pollution Discharge Elimination System Permit and/or an Aquifer Protection Permit as those permits relate to disposal of drilling, development and test waters and/or any other discharge or similar activity. (Well Drilling Contractors)

10. SURVEYS

The Company shall be responsible, or arrange, for all surveys required for the work covered in the Contract, unless otherwise specified.

11. BENCH MARKS, PROPERTY STAKES AND SURVEY STAKES

Bench marks, property stakes and survey stakes shall be preserved by the Contractor; in case they are destroyed or removed by Contractor or its employees, the Company will replace them at the Contractor's expense, and the Contractor and its sureties shall be liable therefore.

12. TOOLS, EQUIPMENT AND MATERIALS

The Contractor shall furnish all of the necessary tools, equipment, and pipeline materials required for the work. All material furnished by the Contractor shall be of the quality specified by the Company in its Construction Specifications (E-8-1).

13. SUPERINTENDENCE BY CONTRACTOR

The Contractor shall assure adequate superintendence of the work by a competent foreman or superintendent (with full authority to act on behalf of Contractor) satisfactory to the Company, who will be on the job at all times when work is in progress.

14. ORDER AND DISCIPLINE

The Contractor shall at all times enforce strict discipline and good order among its employees.

15. INDEPENDENT CONTRACTOR

The Contractor is an independent contractor and any provisions in the Contract, the specifications, or these General Conditions of Contract and Arizona Water Company's Construction Specifications which may appear to give the Company the right to direct the Contractor as to the details of the doing of any work to be performed by the Contractor, or to exercise a measure of control over said work, shall be deemed to mean and shall

mean, that the Contractor shall follow the desires of the Company in the results of the work only and not in the means whereby said work is to be accomplished, and the Contractor shall use its own discretion and shall have complete and authoritative control over the work and as to the details of the doing of the work.

16. PUBLIC SAFETY AND CONVENIENCE

Contractor shall at all times conduct its work so as to ensure the least possible obstruction to traffic and other inconvenience to the general public and the residents and businesses in the vicinity of the work, and to ensure the protection of persons and property.

To protect persons from injury and to avoid property damage, Contractor shall provide and maintain adequate barricades as required during the progress of the work and until it is safe to use the property for its intended purpose. The rules and regulations of the local governmental agencies and specific permit requirements respecting safety provisions shall be observed at all times.

In the case of blasting, the Contractor shall exercise extreme caution to protect the general public and personal and public property from harm or damage.

17. PROPERTY PROTECTION

Trees, fences, poles, and all other property shall be protected unless their removal is authorized by the Company. Any property damaged shall be restored by Contractor, at his expense, to Company's satisfaction.

18. RESPONSIBILITY OF CONTRACTOR

The work shall be under Contractor's responsible care and charge. Contractor shall bear all loss and damage whatsoever and from whatsoever cause, except that caused solely by the act of Company, which may occur on or to the work during the fulfillment of the Contract. If any loss or damage occurs, Contractor shall immediately make good any such loss or damage, and in the event of Contractor refusing or neglecting to do so, Company may, or by the employment of some other person, make good any such loss or damage, and the cost and expense of so doing shall be charged to Contractor.

The mention of any specific responsibility or liability imposed upon Contractor shall not be construed as a limitation or restriction of any general liability or duty imposed upon Contractor by the Contract. The reference to any specific duty or liability being made herein is merely for the purpose of explanation.

Contractor alone shall at all times be responsible for the safety of Contractor, Contractor's employees, and its subcontractors' employees, and for Contractor and its subcontractors' plant and equipment and the method of performing the work.

19. ERRORS AND OMISSIONS

If Contractor, in the course of the work, becomes aware of any errors or omissions in the Contract Documents or in the instructions, or if Contractor becomes aware of any discrepancy between the Contract Documents and the physical conditions of the site of

the work, Contractor shall immediately inform Company in writing. Any work done by Contractor after such discovery, until authorized by Company, will be done at Contractor's risk.

20. LAWS, REGULATIONS

Contractor shall give all notices required by law and comply with all laws, ordinances, rules and regulations, including, but not limited to, all applicable federal, state, local and other legally required health and safety standards, orders, rules, regulations or other laws, pertaining to the conduct of the work. Contractor shall be liable for, and shall defend and indemnify Company against and hold it harmless from, all violations of any law, ordinance, rule, regulation, standard, or order in connection with work furnished by or on behalf of Contractor. If Contractor observes that the Contract Documents are at variance with any law, ordinance, rule, regulation, standard, or order it shall promptly notify Company in writing and any necessary changes shall be adjusted as provided in the Contract for changes in the work. Contractor shall not perform any work contrary to such laws ordinances, rules, regulations, standards, or orders.

21. PERMITS, FEES AND INSPECTIONS

Permits and licenses necessary for the prosecution of the work, including, but not limited to, any National Pollution Discharge Elimination Systems (NPDES) Permits required by U.S. Environmental Protection Agency or the Arizona Department of Environmental Quality shall be secured, paid for, and complied with by Contractor.

Contractor shall be responsible for its actions and shall abide by all conditions and/or restrictions set forth in the NPDES Permit and any other permit or license required for this project.

Company shall at all times have access to the work whenever it is in preparation or in progress and Contractor shall provide proper facilities for such access and for all inspections. If the Contract Documents, the General Superintendent's instructions, laws, ordinances or any public authority require any work to be inspected or approved, Contractor shall give timely notice of its readiness for inspection.

Inspection of the work shall not relieve Contractor of any of its obligations even if defective work or unsuitable materials may have been previously overlooked by Company and accepted or estimated for payment. If any work is found not in accordance with the Contract Documents, Contractor, at its sole cost and expense, shall promptly make good such defective work.

22. CONSTRUCTION MARKING (PIPELINE ONLY)

Each job shall be marked and/or barricaded by the Contractor in such a manner that the construction is clearly visible at all times.

23. EXTRA WORK AND/OR MATERIALS

Except as otherwise herein provided, no charge for any extra work and/or material will be allowed unless the same has been ordered in writing by the Company's Authorized Representative, and the price stated in such order.

24. CHANGES

The Company shall have the right to make any changes in the work that it may determine to be necessary. If such changes affect the cost of the work, an equitable adjustment shall be negotiated. Changes shall in no way affect or void the obligations of both parties under the original Contract.

25. INSPECTION

All work and material shall be open at all times to inspection and acceptance or rejection by the Company's Inspector. Any work covered up by the Contractor prior to inspection and acceptance by the Company shall be subject to being uncovered at the expense of the Contractor for inspection by the Company. The Contractor shall give the Company reasonable notice of starting new work and shall provide, without extra charge, reasonable and necessary facilities for inspection, even to the extent of taking out portions of finished work. In case any such finished work removed is found satisfactory, however, the actual direct cost of such removal and replacement, plus 15% of such cost, will be paid by the Company; in addition, if completion of the work has been delayed thereby, the Contractor shall be granted a suitable extension of time on account of the additional work involved.

26. DEFECTIVE WORK OR MATERIAL

The Contractor shall remove, at its own expense, any work or material found defective by the Company's Inspector and shall rebuild and replace the same without extra charge; in default thereof, the same may be done by the Company at the Contractor's expense.

27. ASSIGNMENT

Neither party to the Contract may assign the Contract or sublet it in whole or in part without the written consent of the other, nor shall the Contractor assign any monies due or which may become due hereunder without the previous written consent of the Company, nor shall such consent release the Contractor from any of its obligations and liabilities under the Contract.

28. RIGHTS OF VARIOUS INTERESTS

Whenever work that is being done for the Company other than by the Contractor is contiguous to work being done by the Contractor, the respective rights of the various interests involved shall be established by the Company to secure the completion of the various portions of the work in general harmony.

29. SUSPENSION OF WORK

The Company's Authorized Representative may at any time and for any reason suspend all or any portion of the work under the Contract. This right to suspend work shall not be construed as denying the Contractor compensation for actual, reasonable and necessary expenses due to suspension to which it may be entitled.

The Company's Authorized Representative may order the Contractor to suspend any work because of certain conditions, such as inclement weather, or because the

Contractor is in violation of these General Conditions of Contract or the Construction Specifications. It is understood that compensation for expenses will not be allowed for such suspension when ordered by the Company's Authorized Representative on account of such conditions.

30. PROCEDURE OF WORK (PIPELINE ONLY)

All work under the Contract shall be planned and performed so as to cause a minimum of interference with normal vehicular and pedestrian traffic. At no time shall the Contractor completely obstruct the traffic to any business establishment during normal work hours of that business. It shall be the Contractor's responsibility to maintain facilities for ingress and egress to any business establishment. When crossing any street, not more than one-half of the street may be blocked at one time. All federal, state, county and city laws, rules and regulations relating to this subject are to be obeyed.

The Contractor shall complete any portion or portions of the work in such order of time as the Company may require. The Company shall have the right to take possession of and use any completed or partially completed portions of the work. If such prior possession or use increases the cost of or delays the work, the Contractor will be entitled to extra compensation or extension of time or both, as the Company may determine.

31. DISPUTES

All questions or controversies which arise between the Contractor and the Company, under, or in reference to, the Contract, shall be decided by the Company's Authorized Representative and a representative of the Contractor, and their decision shall be final and conclusive upon both parties.

32. CONNECTION TO EXISTING SYSTEM (PIPELINE ONLY)

Unless approved in writing by the Company's Authorized Representative, no tie-in or hot tap on the existing system shall be made unless the Company's Inspector is present. When the tie-in requires the operation of an existing valve or other control equipment, the conditions of Paragraph(s) 30 and 33 shall be complied with. The Contractor shall notify the Company twenty-four (24) hours prior to tie-in as to the exact time the Contractor plans to make tie-in so that the Company's Inspector will have sufficient time to locate valves and make necessary preliminary arrangements for shut down.

PLANNED INTERRUPTION OF WATER SERVICE (PIPELINE ONLY)

No valve or other control on an existing Company water system shall be operated for any purpose by the Contractor without approval of the Company's Inspector. All of the Company's water customers whose service is interrupted by a planned interruption, other than in cases of emergency, shall be notified by the Contractor at least twenty-four (24) hours before the planned interruption and advised of the probable time when the service will be restored.

34. EXISTING UTILITY FACILITIES (PIPELINE ONLY)

The Contractor shall notify all known utilities in the area of the work to be performed under the Contract and shall make arrangements to have their facilities marked in

accordance with A.R.S. ?40-360.022 ("Blue Stake Law"). The Contractor shall be responsible for locating and preserving all marked facilities. Any damages to these marked facilities shall be repaired at the expense of the Contractor.

The Company will pay the cost to relocate its or other structures when such structures are found occupying the physical space of the proposed installation. It is understood that the Contractor will be reimbursed for such work only when written authorization from the Company has been obtained in advance of such work.

35. CLEANING UP

The Contractor shall remove from the Company's property and from all public and private property, at its own expense, all temporary structures, rubbish and waste materials resulting from its operations. In the event Contractor fails to do so, the Company may remove same at the expense of the Contractor.

36. WORKING HOURS (PIPELINE ONLY)

Unless stated to the contrary in the Invitation to Bid and/or so stated on the Construction Drawings, or agreed to by the Company during a Pre-Construction Conference, the Contractor shall not be permitted to perform work on Saturdays, Sundays, or Company holidays, or commence work such as tie-ins that cannot be completed during normal working hours.

37. INDEMNITY

- The Contractor shall indemnify the Company against, and save and hold it harmless from, any and all liability, claims, demands, loss, actions, causes of action, expense, penalties, fines, assessments, damages and costs of every kind and nature for injury to or death of any and all persons, including, without limitation, employees or representatives of the Company or of the Contractor or of any subcontractor, or any other person or persons, and for damage, destruction or loss, consequential or otherwise, to or of any and all property, real or personal, including, without limitation, property of the Company or of the Contractor or of any subcontractor, or of any other person or persons. and the violation of any law, ordinance, rule, regulation, standard, or order resulting from or in any manner arising out of or in connection with the performance of the work under the Contract, howsoever same may be caused, including, without limitation, the Company's active or passive negligence. The Contractor shall also, upon request by the Company, and at no expense to the Company, defend the Company in any and all suits, concerning such injury to or death of any and all persons, and concerning such damage, destruction or loss, consequential or otherwise, to or of any and all property, real or personal, including, without limitation, suits by employees or representatives of the Company or of the Contractor or of any subcontractor, or any other person or persons, or concerning any court or administrative proceeding concerning the violation of any law, ordinance, rule, regulation, standard, or order. Excluded from this paragraph are only those injuries to or deaths of persons and damage, destruction or loss, to or of property arising from the sole negligence or willful misconduct of the Company.
- B. Contractor shall indemnify the Company against, and save and hold it harmless from, any and all liability, claims, demands, damages, costs, expenses and attorney's fees, suffered or incurred on account of any breach of any obligation, covenant or other

provision of this contract, including without limitation, breach of the indemnity provisions of subsection A of this Section 37.

C. Contractor further agrees to defend, indemnify and hold harmless the Company, its directors, officers, employees, and agents, from and against any and all costs, damages, claims, expenses, violations, notices of violations, penalties, liens, assessments, and liabilities of every kind and nature, foreseeable or unforeseeable, directly or indirectly, arising from any release, removal, generation, use, storage or disposal on, under, around, or from the well site of any material, substance, or waste, hazardous or non-hazardous, including, without limitation, drilling fluids, mud, cuttings and development and test water howsoever same may be caused, including, without limitation, the Company's active or passive negligence.

38. LIENS

If at any time there shall be evidence of any lien or claim for which the Company might become liable and which is chargeable to the Contractor, the Company shall have the right to retain out of any payment then due or thereafter to become due, an amount sufficient to completely indemnify the Company against such lien or claim. If the Company determines that such lien or claim is valid, the Company may pay and discharge the same, and deduct the amount so paid from any monies which may be or become due and payable to the Contractor.

39. PAYMENT

Upon completion of the installation or construction, the Company will, within thirty (30) days after receipt of proper invoice and labor and material releases, pay the amount due the Contractor. If the Company believes that additional work, such as clean up, is required, it may deduct the total cost of such additional work from the amount to be paid to Contractor.

40. COMPANY'S RIGHT TO TERMINATE CONTRACT: DAMAGES DUE TO DELAY

If the Company finds the Contractor to be in material violation of any section of these General Conditions of Contract, Construction Specifications or Standard Specification Drawings or if the Contractor refuses or fails to prosecute the work, or any separable part thereof, with such diligence as will insure its completion within the time specified or any extension thereof, or fails to complete said work within such time, or when any other cause exists to justify such action, the Company may, without prejudice to any other right or remedy, by written notice to the Contractor, terminate its right to proceed with the work or such part of the work as to which there has been such violation, delay or other cause.

In the event the Contractor's right to proceed is terminated, the Company may take over the work and take possession of, and utilize in completing the work, such materials as may be on the site of the work and necessary therefore and prosecute said work to completion by whatever method it may deem expedient. The Contractor and its sureties shall be liable to the Company for any excess cost caused thereby.

In the event the Contractor's right to proceed with the work is terminated, the Contractor shall not be entitled to receive any further payment until the work is completed or the job is canceled. If the unpaid balance of the Contract price exceeds the expense of finishing

the work, including compensation for additional managerial and administrative services, such excess shall be paid to the Contractor. If such expenses exceed such unpaid balance, the Contractor shall pay the difference to the Company.

41. GUARANTEE

The Contractor shall guarantee all deslabor and workmanship and any materials it installs for a period of one year following the date of completion and acceptance by the Company. If any portion of the work or any of the materials become defective within the guarantee period, the Company will notify the Contractor of such defect. The Contractor must repair any defect within fifteen (15) days of such notification. If repairs are not completed within this time period, the Company may repair the defect, or cause such defect to be repaired, and the cost of such repairs shall be paid by the Contractor. The Company reserves the right to determine which defects are the result of poor labor and workmanship and which are caused by defective materials.

42. <u>LIQUIDATED DAMAGES FOR NON PERFORMANCE: REQUEST FOR EXTENSION(S) OF TIME</u>

Time is of the essence in the Contract. The time period required for completion of the work will be specified in the Contract. The Contractor agrees that the Company will suffer substantial damages in the event the Contractor fails to complete the work within the agreed upon time period. The Contractor and the Company agree that since it would be impracticable or extremely difficult to precisely fix such damages, a reasonable approximation of such actual damages suffered by the Company shall be a sum equal to 0.5% of the Contract price for each working day beyond the time period for completion of the work specified in the Contract.

Request by the Contractor for extensions of the time period shall be in writing and shall not become effective until approved in writing by the Company's Authorized Representative.

43. PAYMENT FOR REQUIRED TESTING

Whenever testing is required by any governmental agency or by the Company to assure conformance of the Contractor's work with the appropriate standard, it will be paid for as follows:

- a. For testing required under permits obtained by the Company or testing specifically requested by the Company, the cost of the first test will be paid for by the Company. In the event of failure of the first test, the cost of all further testing associated with the failure will be paid by the Contractor.
- b. For testing required under permits obtained by the Contractor, all costs will be paid by the Contractor. Testing of the pipeline for pressure and leakage will be included in the Contract price.

44. CONTRACT DEADLINES AND BONDS REQUIREMENTS

The time limits to be allowed for the completion of any work covered in the Contract shall be established as follows: In the proposal submitted to the Company, in response to the Invitation to Bid, the Contractor shall state the number of calendar days required for completion of the work. The time required will become a part of the Contract. When the Company is ready to proceed with the work, a Commencement Notice will be issued by the Company to the Contractor by mail. The Commencement Notice will allow the time required in the Contract plus ten (10) calendar days and will indicate the final day of the time allowed. The work cannot begin until the Company has received a performance bond and materials payment bond for the Contract price unless the bonds have been waived under the special conditions section of the Contract. The additional ten (10) days is the allowance for time to deliver the Commencement Notice to the Contractor and for the Contractor to return the performance bond and materials payment bond to the Company. Time extensions will be granted if warranted, and only at the time of the delay, thus extending the final day of the time allowed.

If the Company elects not to require a performance bond and a material payment bond for the work, the cost of the bonds will be deducted from the proposed total cost and the Contract will reflect this reduced cost and the bonds requirements will be waived under special conditions of the Contract.

ARIZONA WATER COMPANY

CONSTRUCTION SPECIFICATIONS: E-8-1

ARIZONA WATER COMPANY

E-8-1

CONSTRUCTION SPECIFICATIONS FOR THE INSTALLATION OF WATER DISTRIBUTION SYSTEMS DUCTILE IRON

DEFINITIONS

- A. <u>Company</u>. The words "Company" or "Arizona Water Company" mean Arizona Water Company, and where applicable, any division of Arizona Water Company, whose principal place of business is located at 3805 North Black Canyon Highway, Phoenix, Arizona 85015-5351 (Post Office Box 29006, Phoenix, Arizona 85038-9006).
- B. <u>Company's Authorized Representative</u>. The words "Company's Authorized Representative" mean any officer of the Company, and any of the Company's Engineers, any Division Manager or Superintendent of the Company and/or such other person(s) designated in writing as the "Company's Authorized Representative" by the President or any Vice President of the Company.
- C. <u>Contractor</u>. The word "Contractor" means either an individual or other entity employed to do the work as shown on the Construction Drawings and as specified herein.
- D. <u>Construction Drawings</u>. The words "Construction Drawings" mean plans prepared by or on behalf of Arizona Water Company.
- E. <u>Contract</u>. The word "Contract" means the written document titled "Proposal/Contract" when such document has been signed by an officer or other authorized representative of both the Contractor and the Company.

CONSTRUCTION SPECIFICATIONS FOR THE INSTALLATION OF WATER DISTRIBUTION SYSTEMS DUCTILE IRON

1. GENERAL

All work is to be completed in a safe, workmanlike manner and in accordance with these Construction Specifications; any deviation therefrom must be approved in writing by the Company.

Installations must conform with the requirements of all governmental regulating agencies and the cost of conforming to such regulations must be included in the unit bid prices. Examples of such regulations, without attempting to be inclusive, are:

- a. Special compaction and paving for street crossing.
- b. Shoring when required because of the trench depth.
- Closing a trench in those areas where no open trench is allowed overnight.
- d. Barricading and traffic control as required.

2. LOCATION MARKING

Alignment stakes as required in the opinion of the Company shall be furnished by the Company to the Contractor and shall be set by the Company at agreed upon intervals and offsets. Under normal circumstances these will reference the pipeline location five feet (5') into the right-of-way measured from property pins. Grade stakes will be provided only when the Construction Drawings show a pipeline depth other than covered in these Specifications. It is the responsibility of the Contractor to preserve all survey work.

3. TRENCH EXCAVATION

The trench location is to be determined by the Construction Drawings.

FOR 8-INCH OR SMALLER PIPE: The depth of the trench prior to pipe laying shall be such that the finished pipeline shall have between thirty-six inches (36") and forty-two inches (42") of cover unless otherwise specified on the Construction Drawings.

FOR 12-INCH AND LARGER PIPE: The depth of the trench prior to pipe laying shall be such that the finished pipeline shall have between forty-eight inches (48") and sixty inches (60") of cover unless otherwise specified on the Construction Drawings.

The width of the trench at and below the level at the top of the pipe shall be a minimum of twelve inches (12") plus the outside diameter of the pipe barrel and a maximum of twenty-four inches (24") plus the outside diameter of the pipe barrel.

The bottom of the trench shall be accurately graded to provide a uniform bearing for each length of pipe for the full length of the pipe. If the native material on the trench bottom can be reasonably dug by hand, bell holes shall be dug for the joints so that the joints in no way support the pipe. When native materials such as rock are encountered during trenching that will not provide a uniform support for the pipe, the trench will be over-excavated an additional six inches (6") and suitable bedding material will be placed in the trench.

Bedding material will be placed by hand in four-inch (4") lifts and compacted to ensure uniform compaction and to eliminate any voids under the pipe. When the space between the pipe and trench bottom varies, this must be backfilled and compacted in four-inch (4") lifts to the mid-section of the pipe.

Whenever the trench is over-excavated for whatever reason, the trench bottom will be brought up to the correct depth at the Contractor's expense using either method (a) or (b) as follows:

- a. A.B.C. material shall be used and compacted to a uniform density of not less than 80% of the maximum density as determined by AASHTO T-99 method A and T-191.
- b. Native material 100% of which will pass through a one and one-half inch (1½") screen and at least 20% of which will pass through a number-8 screen shall be used and compacted to a uniform density of not less than 85% of the maximum density as determined by AASHTO T-99 method A and T-191.

4. MATERIALS TO BE PROVIDED BY CONTRACTOR

Unless otherwise specified on the Construction Drawings or in the Contract, the Contractor will supply all of the necessary materials which will become a permanent and integral part of the water distribution system, including concrete blocking, anchors, backfill material, paving material and supplies used during the prosecution of the work. All materials provided by the Contractor to construct the water distribution system must be NSF Standard 61 approved. All potable water pipes and fittings shall have NSF-PW seal. Construction materials used in the water system shall be lead free as defined at AAC R28-4-504 and R18-1-101. The Contractor will provide the following materials:

- a. FIRE HYDRANTS: Mueller Super Centurion 250 Fire Hydrant, meets ANSI/AWWA C502 Standard, Model No. A-423, 5¼" main valve opening, three way, 6" Mechanical Joint Shoe, 1½" pentagon operating nut, color yellow, drain open, open direction left, 4' or 4'6" bury depending on application. For pumper and hose nozzle information see below.
 - (1) 1 4" Pumper Nozzle, NST and 2 2½" Hose Nozzles, NST. (These locations only: Ajo, Casa Grande, Coolidge and San Manuel.)
 - (2) 1 4½" Pumper Nozzle, NST and 2 2½ " Hose Nozzles, NST. (These locations only: Apache Junction, Arizona City, Lakeside, Oracle, Overgaard, Pinewood, Rimrock, Sedona, Sierra Vista, White Tank and Winkelman.)
 - (3) $1 4\frac{1}{2}$ " Pumper Nozzle, NST and $2 2\frac{1}{2}$ " Hose Nozzles, NPT (Bisbee only.)
 - (4) 1 3" Pumper Nozzle GA 6-350 (6 threads per inch, 3.50 pitch diameter) and 2 2½" Hose Nozzles, NPT (Miami only.)

- (5) $1-3\frac{1}{2}$ " Pumper Nozzle GA 6-411 (6 threads per inch, 4.11 pitch diameter) and $2-2\frac{1}{2}$ " Hose Nozzle, NST (Superior only.)
- b. FITTINGS: Manufactured by Tyler or Union. Crosses, Elbows, Tees, Cap, Reducer, Adapter, Plug, Blind Flange and Tapped Flange; Ductile Iron, Class 350, SSB, Cast Iron Cement Lined.
 - (1) Foster Adaptors for MJ, made by Infact Corporation: Available in size 4" to 16". Part No. 4" = 4FA-BC, 6" = 6FA-BC, 8" = 8FA-BC, 10" = 10FA-BC, 12" = 12FA-BC, 16" = 16FA-BC.
- c. DETECTOR CHECK VALVE: Mueller/ Hersey EDC III, iron body, including 5/8" x ¾" Trim Kit. Trim Kit Part No.: 4" = 282080, 6" = 282082, 8" = 282085, 10" = 282496.
- d. GATE VALVES: Mueller Resilient Wedge Gate Valves, meets AWWA C509 specification, 250 psig, Non-rising stem, Part No. A-2360 sizes 4" through 12"; Part No. A-2361 sizes 14" through 36", low zinc stems, epoxy coated inside and outside to meet the NSF 61 rating. The bonnet and stuffing box shall have 304 stainless steel bolts/nuts.
- e. TRACER WIRE and WARNING TAPE:
 - TRACER WIRE: Shall be direct bury AWG #14 solid copper wire, Color: Blue.
 - 2. WARNING TAPE: Reef Industries, Standard Terra Tape in 3" widths. Color: Blue and imprinted 'Arizona Water Company'.
- f. AIR RELEASE VALVE: Crispin Model AR10 with 1" NPT inlet and ½" NPT outlet, cast iron body and top flange; with a 5/64" orifice with stainless steel valve sealing faces and BUNA-N rubber.
- g. PRESSURE RELIEF VALVE: Watts 174A, Model M, 2" inlet, 2" outlet, Bronze Body, 30lb. to 150lb. pressure range.
- h. MEGA LUG: Mechanical Joint restraint made of ductile iron conforming to ASTM 536-80, 250 psi made by EBAA Iron, Inc., series 1100 or equal.
- i. METER BOXES:
 - (1) Concrete Box with a steel regular lid, Number 1: Tucson specification.
 - (2) Concrete Box with a steel regular lid, Number 2, 3, and 4: Phoenix specification.
- j. PIPE, COPPER: Type K soft copper in 60 or 100-foot coils, per ASTM B88.
- k. PIPE, DUCTILE IRON: Ductile Iron Pipe, Cement Lined, Push-on, conform to current ANSI/AWWA Specification A21.51/C151, Pressure Class 350 (sizes 4" through 12"), Pressure Class 250 (sizes 14" through 20"), or Pressure Class 200 for 24" through 36" pipe. Vendors:

- (1) Pacific States Cast Iron Pipe Company
- (2) Griffin Pipe
- (3) United States Pipe and Foundry Company
- (4) American Ductile Iron Pipe
- (5) Clow Pipe (McWane, Inc.)
- I. PIPE, PLASTIC: Plastic pipe, C-900 PVC per ANSI/AWWA C900, Class 150, sizes 6" through 12". NSF61 approved. Furnished in laying lengths of 20'. The barrel shall conform to the outside dimensions of steel pipe (IPS) or cast iron (CI) pipe equivalent and the wall thickness of dimension-ratio (DR) 18.
- m. POLYETHYLENE ENCASEMENT (Polywrap): For all pipeline and related fittings installed, EXCEPT for the Coolidge Division. Minimum 8 Mil. and installed per AWWA C105/A21.5-93 and ASTM A-674-89. Manufactured by the Pacific States Cast Iron Pipe Company. The wrapping tape shall be minimum 10 mil. vinyl tape. No duct tape shall be used.
- n. COUPLING: Mueller, straight three part union, tested to meet ANSI/AWWA C800, H15403, conductive compression.

Mueller, H15428, straight coupling, conductive compression by male iron pipe, tested to meet ANSI/AWWA C800 specification. Size: 2".

Mueller, H15451, straight coupling, conductive compression by female iron pipe, tested to meet ANSI/AWWA C800 specification. Size: 2".

Viking Johnson brand, sold by Mueller: MaxiFit Straight (2"-24"), MaxiFitXtra Straight (4"-8") or MaxiStep Transition, tested to meet AWWA/ANSI C.219-91 specifications – certified to ISO 9001:1994 / Smith – Blair Quantum.

o. STOP, ANGLE METER, BALL: Mueller, valve, B24258, conductive compression by meter swivel nut, tested to meet ANSI/AWWA C800, size 5/8 " x ¾" x ¾" for a ¾" service or size 1" for a 1" service.

Mueller, valve, B24265, female pipe thread by meter swivel nut, tested to meet ANSI/AWWA C800, size 5/8" x 3/4" for a 3/4" service or size 1" for a 1" service.

p. STOP, CORP: Mueller, ball valve, B25008, taper thread by conductive compression, tested to meet ANSI/AWWA C800 specification, sizes: 3/4", 1" and 2".

Mueller, ball valve, B25028, iron pipe thread by conductive compression, tested to meet ANSI/AWWA C800 specification. Sizes 3/4", 1", and 2".

Mueller, 300 Ball Curb Valve, B-25122, taper thread by conductive compression, tested to meet ANSI/AWWA C800 specifications, size: 2". (2" service)

- q. STOP, CURB: Oriseal valve, H10291, iron pipe thread by iron pipe thread, quarter turn check, brass, tested to 300 psi working pressure, tested to meet ANSI/AWWA C800 specification, size: 2".
 - Mueller, B20283, Mueller 300 ball curb valve, female iron pipe by female iron pipe, quarter turn check, tested to meet ANSI/AWWA C800 specification. Size: 2". (Blow-off E-9-8-1).
- r. TAPPING SADDLE: Smith Blair, Cast Bronze ASTM-B584 85-5-5-5, double strap, iron pipe threads, Models 321 and 323. Washers are silicon bronze, ASTM-B36. Gaskets are grade 60 Buna N, or Mueller bronze double strap service saddle, BR 2 B series, cast bronze, ASTM-B585, 85-5-5-5, or H16084, 200 psig, meets ANSI/AWWA C800.
- s. TAPPING SLEEVE: Mueller H304 Stainless Steel Tapping Sleeve, JCM 432 18-8 Type 304 Stainless Steel Tapping Sleeve, Romac "SST" Type 304 Stainless Steel Tapping Sleeve or CASCADE-style CST-EX stainless steel pressure-rated tapping sleeve.
- t. TAPPING VALVE: Mueller Resilient Wedge tapping valve, Catalog Number T-2360-16, Class 125, sizes 4" through 12"; T-2361-16, Class 125, sizes 14" to 36" all with Type 304 stainless steel fasteners; bypass valves are required on 18" 36" valves flange by mechanical joint per ANSI/AWWA C111, iron wedge, non-rising stem. Epoxy coated interior/exterior per ANSI/AWWA C550 for NSF 61 compliance. 250 PSI range for valves 4" to 12". 150 PSI range for valves 14" to 36".
- u. U-BRANCH: Mueller, H15364, 1" male iron pipe by ¾" male iron pipe, tested to meet ANSI/AWWA C800 specification. Size: 1" x ¾" x 13½", straight line.
- v. VALVE BOXES: Valve Box with Cover, adjustable, Tyler 562-A or equal, made of cast iron.
- w. VAULTS: Utility Vault Company, Chandler, AZ.
 - (1) 4484-WA concrete vault with a 3660 aluminum double torsion door with a recessed padlock hasp, two 18" x 24" center knockouts.
 - (2) 575-WA concrete vault with a 4874 aluminum double torsion door with a recessed padlock hasp, two 18" x 24" center knock outs and adjustable frame.
 - (3) 612-5X-WA concrete vault with a 4874 aluminum double torsion door with a recessed padlock hasp, two 18" x 24" center knockouts.
- x. VALVE, METER: Mueller, B24265-1, Mueller 300 ball angle meter valve, female iron pipe by meter nut, quarter turn check, lock wing, tested to meet ANSI/AWWA C800 specification. Size: 1".

Mueller, B25170, Mueller 300 ball straight valve, conductive compression by female iron pipe, quarter turn check, lock wing, tested to meet ANSI/AWWA C800 specification. Size: 1".

y. YOKES, METER: Relocator type copper meter yoke with horizontal inlet and outlet and meter thread ends, B24118, with lock wing Mueller 300 angle ball valve, full port, sizes: 1" x 12", 5/8" x ¾" x 7", 5/8 x ¾" x 9".

Mueller, 2" copper meter yoke with horizontal inlet and outlet and female iron pipe threads, B2423-99000, with lock wing Mueller 300 ball angle meter valves on inlet and outlet risers. Raised 1" by-pass with lock wing Mueller 300 ball valve.

The Contractor also will be required to provide the following materials, the cost of which will be included in its unit bid price:

All material and concrete for thrust blocks, other anchors, reinforcing steel; all gravel, crushed stone, A.B.C., earth, sand, or screened material which may be required; all material for bracing and shoring trenches and for construction of forms; all barricades and traffic control equipment; all material for paving replacement and any water used for compaction of backfill.

5. INSTALLATION OF MATERIALS

All materials are to be installed in accordance with manufacturers recommendations unless otherwise directed by these Specifications.

All pipe, fittings and valves shall be laid true to the lines, grades and locations established by the Specifications and the Construction Drawings.

The ends and inside of the pipe shall be thoroughly cleaned and inspected for damage. No damaged materials shall be installed in the water distribution system.

Whenever the work ceases for any reason, all open pipeline ends shall be tightly plugged by the Contractor. Plugs shall be watertight and approved by the company.

Concrete thrust blocks of the sizes required by the plans and specifications are to be provided at all valves, changes in direction or size, or at any other point where an unbalanced thrust due to water pressure would exist. Thrust blocks are to be formed to prevent any concrete from spilling over or into a joint.

Trench curves as shown on the Construction Drawings may be made without fittings when using push on joint pipe up to twelve inches (12") in diameter, if the deflection of the pipe does not exceed five degrees (5°) or nineteen inches (19") per eighteen-foot (18') length of pipe. The minimum radius of such curves will be two hundred five feet (205').

Prior to construction, the appropriate agency(ies) will be notified as required by the permit(s).

It shall be the Contractor's responsibility to uncover all existing water lines being connected to, and to verify the location, depth and size of pipe before any construction begins.

Any construction performed without the knowledge of the duly authorized representative is liable for removal and replacement at the Contractor's expense.

All fire hydrants, frames, covers and valve boxes, etc. shall be adjusted to finished grade prior to the placing of the asphalt concrete surface course by the Contractor (where applicable).

Air release valves shall be installed at water system high points per Standard Detail E-9-8-2.

All water services shall be set a minimum of two feet (2') on the customer's property, preferably within the P.U.E. and not within right-of-way.

Unless otherwise specified on the construction drawings, all water mains shall be installed five feet (5') from the property line inside the right-of-way or easement.

Water valves shall be spaced not more than five hundred feet (500') in commercial districts and not more than eight hundred feet (800') in other districts. Variations may be required for transmission mains or special applications.

Installation of water line casing shall be per Standard Specification E-9-24-1.

Tracer Wire and Warning Tape are to be installed on all mains, tees, crosses, ells and fire hydrant laterals. They will not be installed on service lines. The tracer wire will be installed on the water main 45 degrees from the vertical centerline of the pipe and shall be taped to the fittings directly and on the main every 10 feet using a minimum 10 mil vinyl tape. The tracer wire shall be placed between the valve riser and box with a minimum of 12" of wire inside. The warning tape shall be installed a minimum of two feet below the surface, being measured from final grade, directly over the center of the pipe. Any splices in the tracer wire shall be joined using waterproof connectors. Any splices in the warning tape shall be joined using minimum 10 mil vinyl tape. The tracer wire shall be tested for continuity after backfill and compaction, but before paving. Any detected damages to the wire shall be repaired before paving will be allowed.

6. BACKFILL OF WATER MAIN TRENCHES

Backfill of any excavation shall conform to the requirements of any of the governmental agencies having jurisdiction over the location. If no governmental agency having such jurisdiction specifies backfill or compaction requirements, and no special requirements are shown on the Construction Drawings, the procedure set forth in this section will apply for water line trenches.

The bedding material above the pipe and backfill material shall be compacted to a minimum of 70% compaction within a utility easement and 80% compaction within a right-of-way as determined by AASHTO T-99 method A and T-191. If water settling is used for compaction, it is the responsibility of the Contractor to prevent the pipe from floating.

The bedding material shall be either native material, 100% of which will pass through a one and one-half inch (1½") screen and at least 20% of which will pass through a number-8 screen, or imported material which conforms to M.A.G. specifications for A.B.C. or type-B

select materials. Bedding material shall be used below and around the pipe and a minimum of twelve inches (12") above the pipe. Shade and bedding material to be mechanically compacted prior to remainder of trench back-fill.

The remainder of the trench shall be backfilled with native or imported material which shall be of sound earthen material free from broken concrete, wood, broken pavement, or other unsuitable substances. Except as otherwise specified, backfill may be material containing no pieces larger than six inches (6") in greatest dimension.

Where settlement occurs, additional backfill material shall be placed and compacted and the trench shall be brought to final grade.

7. HYDROSTATIC TESTING OF COMPLETED PIPELINES

Hydrostatic testing of water pipelines will be completed before the new system is connected into the existing water system so that all testing can be done against all new materials.

The completed section of water pipeline to be tested shall be slowly filled with water with care being taken to expel all air from the pipe. If necessary, the pipe will be tapped at high points to vent air.

The Contractor shall provide all equipment and labor necessary to accomplish this testing and the price shall be included in the unit prices. The Contractor shall notify the Company in advance of the testing so that the Company can schedule a duly authorized representative to be at the site during testing. The Contractor, at its own expense, shall make any necessary repairs to the system being tested in order to cause the section being tested to meet the test limits set below. The Contractor may request authorization of the Company to connect the new pipelines to the existing system prior to completion of pressure testing when, in the Company's sole opinion and judgment, conditions warrant such connection.

The Contractor shall assume all responsibility to complete pressure testing to Company's specifications after such connection, including, but not limited to, isolation of the new pipelines from the existing system, if necessary.

Connections prior to completion of pressure testing shall not be made unless prior Company authorization has been obtained, and any extra expenses resulting from such connections shall be the sole responsibility of the Contractor.

Leakage tests will be for a period of two hours at 200 ± 5 psi at the point of lowest elevation; leakage may not exceed 0.1 gallons per hour per one thousand feet (1,000') of pipe per inch of diameter. If dry utilities are not installed, a second pressure test is required.

8. STERILIZATION AND FLUSHING OF COMPLETED WATER PIPELINES

Sterilization and flushing will conform to recommendations of Arizona State Department of Health Services Engineering Bulletin Number 8, latest edition, or any future Arizona Department of Environmental Quality bulletins. Contractor to follow all conditions of any discharge permit.

NO OTHER UTILITIES ALLOWED IN OR NEAR WATER PIPELINE TRENCHES

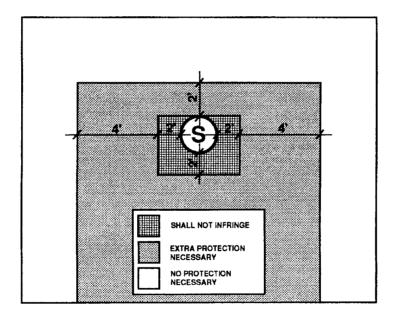
No other utility installations will be permitted in the water pipeline trench or within five feet (5') of the Company's water pipeline when running parallel to the water pipelines.

10. PROTECTION OF WATER MAINS NEAR SEWERS

In order to protect water mains from contamination by sewers, the installation of the water mains must conform to the following requirements:

a. Horizontal - When water lines and sewers are laid parallel with each other, the horizontal distance between them shall not be less than six feet (6'). Each line shall be laid on undisturbed or bedded material in a separate trench. Where conditions prevent the minimum horizontal separation set forth above, extra protection will be required. Extra protection shall consist of constructing the sewer main with mechanical joint ductile iron pipe or with slip-joint ductile iron pipe if joint restraint is provided, or encasing the sewer main in concrete. Extra protection shall consist of constructing the water main with mechanical joint ductile iron pipe or with slip-joint ductile pipe if joint restraint is provided. The water main shall not be encased in concrete.

The Construction Drawings shall indicate the installation requirements. The drawings showing these exceptions shall have been approved by the appropriate state and/or county health department. Refer to the diagram below for clarification.



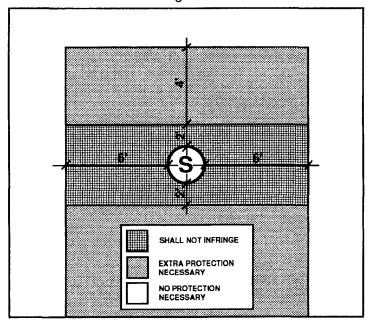
Under no circumstances will the horizontal separation between sewer mains and water mains be less than two feet (2'). All distances are to be measured from the outside of the sewer main to the outside of the water main.

b. Vertical - When a water main is parallel with or crosses a sewer main within two feet (2') above the sewer or greater than two feet (2') below the sewer, extra protection will be required. Extra protection shall consist of constructing the sewer main with mechanical joint ductile iron pipe or with slip-joint ductile iron pipe if joint restraint is provided, or encasing the sewer main in concrete. Extra protection shall consist of constructing the water main with mechanical joint ductile iron pipe or with slip-joint ductile pipe if joint restraint is provided. The water main shall not be encased in concrete.

The Construction Drawings shall indicate the installation requirements. The drawings showing these exceptions shall have been approved by the appropriate state and/or county health department.

Under no circumstances will the vertical separation of a sewer main installed above a water main be less than two feet (2'). All distances are to be measured from the outside of the sewer main to the outside of the water main. Refer to the diagram above for clarification.

- c. When unusual conditions such as, but not limited to, highway or bridge crossings prevent the water and sewer main separations required from being met, the appropriate state and/or county health department will review and may approve requests for authorization to use alternate construction techniques, materials and joints on a case-by-case basis.
- d. No water pipe shall pass through or come into contact with any part of a sewer manhole. The minimum horizontal separation between water mains and manholes shall be six feet (6'), measured from the center of the manhole.
- e. The minimum separation between force mains or pressure sewers and water mains shall be two feet (2') vertically and six feet (6') horizontally under all conditions. Where a sewer force main crosses above, or less than six feet (6') below, a water line, the sewer main shall be encased in at least six inches (6") of concrete for ten feet (10') on either side of the water main. Refer to the diagram below for clarification.



- f. Sewer mains (gravity, pressure, force) shall be kept a minimum of fifty feet (50') from drinking water wells, unless the following conditions are met:
 - Water main pipe, pressure tested in place to 50 psi without excessive leakage, may be used for gravity sewers at distances greater than twenty feet (20') from drinking water wells.
 - Water main pipe, pressure tested in place to 150 psi without excessive leakage, may be used for pressure sewers and force mains at distances greater than twenty feet (20') from drinking water wells.
- g. No septic tank/disposal field system shall be constructed within one hundred feet (100') of a drinking water well.
- h. All distances are measured perpendicularly from the outside of the sewer main to the outside of the water main. These separation requirements do not apply to building, plumbing or individual house service connections.
- Use Mechanical Joint ductile iron pipe with Megalug thrust restraints a minimum of ten (10') feet on each side of a sewer or storm drain crossing.

11. COMPACTION

When crossing existing water mains a minimum of 95% compaction is required to the bottom of existing mains.

Arizona Water Company requires that no slurry be permitted to contact existing cement/asbestos or ductile iron pipes, unless authorized by the company. Slurry may be poured in the bottom of the sewer trench stopping three inches (3") below the existing water main. The backfill used around the main should be AB in sufficient depth to prevent slurry from contacting existing main.

12. WATER MAIN MATERIAL SPECIFICATIONS

Ductile iron pipe (Push-on type) minimum class 350, cement lined and conform to AWWA C151.

All main line valves shall conform to AWWA C500 with a minimum working pressure of 200 psi.

All cast iron fittings to be cement lined in accordance with AWWA C104 and shall conform to AWWA C110 with a minimum working pressure of 250 psi. Except for the Coolidge System – See Note 4L.

Maximum joint deflection for 6" mechanical joint ductile iron pipe is seven degrees, seven minutes (7°, 7') or twenty-seven inches (27") per eighteen-foot (18') length pipe, for a maximum curve of one hundred forty-five feet (145').

Maximum joint deflection for 8" and 12" mechanical joint ductile iron pipe is five degrees, twenty-one minutes (5° 21') or twenty inches (20") per eighteen-foot (18') length pipe, for a maximum curve of one hundred ninety-five feet (195').

Maximum joint deflection for 6", 8" and 12" push-on joint ductile iron pipe is five degrees (5°) or nineteen inches (19") per eighteen-foot (18') length pipe for a maximum curve of two hundred five feet (205').

ARIZONA WATER COMPANY

STANDARD SPECIFICATION DRAWINGS: E-9-1

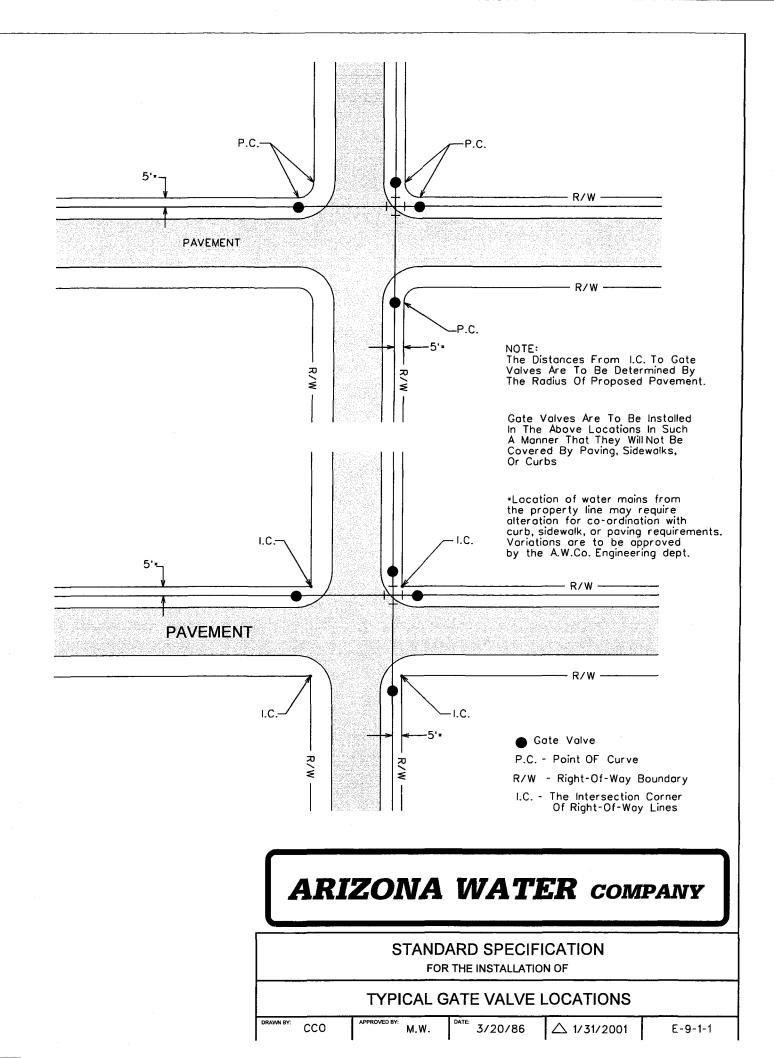
ARIZONA WATER COMPANY

STANDARD SPECIFICATION DRAWINGS

INDEX (E-9)

E-9-1	TYPICAL GATE VALVE LOCATIONS
E-9-2	INSTALLATION OF TYPICAL VERTICAL AND HORIZONTAL GATE VALVES
E-9-3	INSTALLATION OF TYPICAL TAPPING SLEEVE AND VALVE
E-9-4	INSTALLATION OF TYPICAL VALVE SUBJECT TO NON-VEHICULAR AND VEHICULAR TRAFFIC
E-9-5	INSTALLATION OF TYPICAL THRUST BLOCKING SCHEDULE, THRUST BLOCK FOR VERTICAL BENDS, AND MEGALUG THRUST RESTRAINTS
E-9-6	INSTALLATION OF TYPICAL PERPENDICULAR FIRE HYDRANT
E-9-7	INSTALLATION OF TYPICAL PARALLEL FIRE HYDRANT
E-9-8	INSTALLATION OF TYPICAL 2" BLOWOFF DEVICE, AND AIR RELEASE VALVE
E-9-9	INSTALLATION OF TYPICAL SINGLE SERVICE CONNECTION FOR A $^3/_4{}^{\shortparallel}$ OR 1" METER
E-9-10	INSTALLATION OF TYPICAL DOUBLE SERVICE CONNECTION FOR A $^3\!/_4$ " AND 1" METER
E-9-11	INSTALLATION OF TYPICAL 2" SERVICE CONNECTION
E-9-12	INSTALLATION OF 3" COMPOUND METER, 4" COMPOUND METER, 6" COMPOUND SERVICE, CONCRETE VAULT, AND NON-POTABLE PROPELLER METER
E-9-13	INSTALLATION OF TYPICAL 4" THRU 8" DETECTOR CHECK VALVES AND 3" THRU 10" REDUCED PRESSURE PRINCIPLE DETECTOR WITH BYPASS METER ASSEMBLY (RPDA) FOR FIRE LINE SERVICES
E-9-14	INSTALLATION OF TYPICAL PRESSURE RELIEF VALVE ASSEMBLY
E-9-15	INSTALLATION OF TYPICAL PRESSURE REDUCING STATION
E-9-16	PAINT COLOR SELECTION
E-9-17	STEEL WATER STORAGE TANK
E-9-18	HYDROPNEUMATIC TANK
E-9-19	INSTALLATION OF WELL SHELTER

E-9-20	INSTALLATION OF TYPICAL WELL WITH LINE SHAFT TURBINE PUMP
E-9-21	INSTALLATION OF TYPICAL WELL WITH SUBMERSIBLE TURBINE PUMP
E-9-22	INSTALLATION OF COLUMN PIPE, OIL TUBE AND LINE SHAFT
E-9-23	HOT TAP AND JUMPER METER CONNECTION
E-9-24	INSTALLATION OF TYPICAL WATER LINE ENCASEMENT
E-9-25	INSTALLATION OF CALCIUM HYPOCHLORITE TABLET CHLORINATOR
E-9-26	INSTALLATION OF CHAIN LINK FENCE
E-9-27	INSTALLATION OF SIDE HUNG WATER LINE SUSPENSION
E-9-28	PIPE WARNING TAPE, LOCATOR WIRE, AND LOCATOR WIRE TERMINATION
E-9-29	INSTALLATION OF A TYPICAL SAMPLING STATION

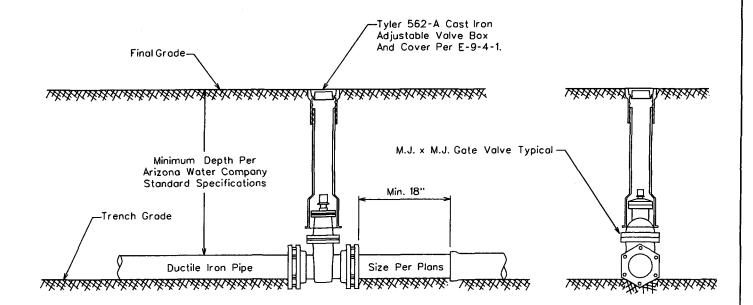


FOR 6" THROUGH 12" GATE VALVES

Mueller Resiliant Wedge Gate Volves Catalog Number A-2360-__ ANSI/AWWA C509 Compliant

FOR 14" THROUGH 16" GATE VALVES

Mueller Resiliant Wedge Gate Valves Catalog Number A-2361-__ ANSI/AWWA C509 Compliant



All Valves Installed On Pipe Five Feet (5') Deep And Greater Are To Be Installed With A Valve Operator Extension, Mueller Catalog No. A-26441.

E-9-2-1

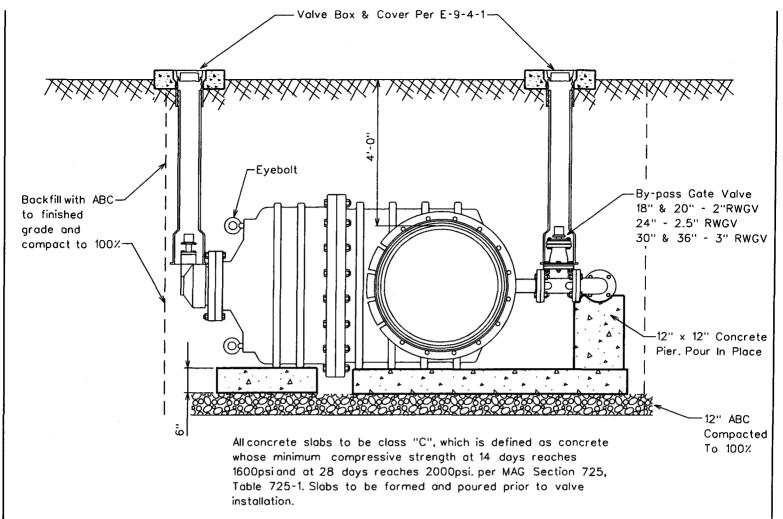
ARIZONA WATER COMPANY

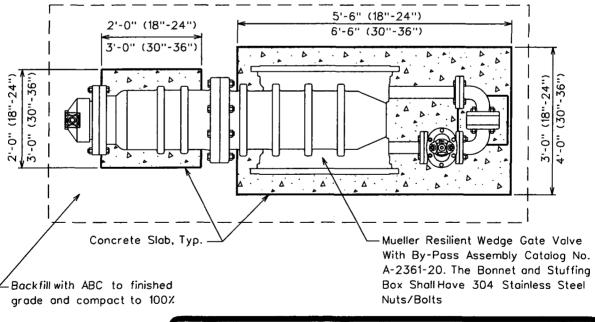
STANDARD SPECIFICATION

FOR THE INSTALLATION OF

TYPICAL VERTICAL GATE VALVES

BY: CB | APPROVED BY: MW | DATE: 03.20.1986 | \(\triangle \) 08.23.2006





All valves installed on pipe five feet and greater are to be installed with a valve operator extension Mueller catalog No.A-26441 The distance is measured from the top of the operating nut to final grade.

ARIZONA WATER COMPANY

STANDARD SPECIFICATION

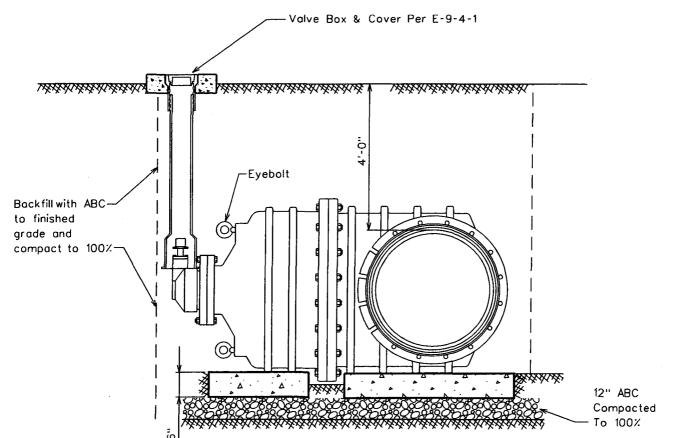
FOR THE INSTALLATION OF

INSTALLATION OF BEVEL GEARED HORIZONTAL GATE VALVES
WITH BY-PASS FOR 18" AND LARGER VALVES

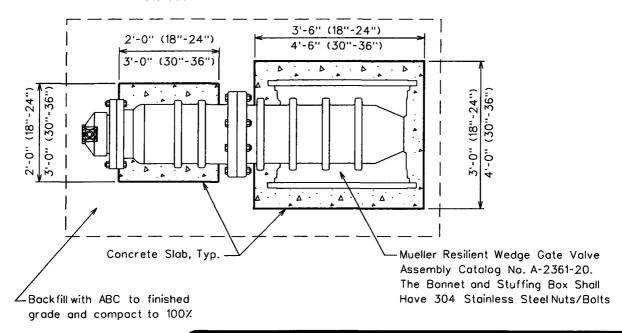
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DATE:

T A



All concrete slabs to be class "C", which is defined as concrete whose minimum compressive strength at 14 days reaches 1600psi and at 28 days reaches 2000psi. per MAG Section 725, Table 725-1. Slabs to be formed and poured prior to valve installation.



All valves installed on pipe five feet and greater are to be installed with a valve operator extension Mueller catalog No.A-26441 The distance is measured from the top of the operating nut to final grade.

ARIZONA WATER COMPANY

STANDARD SPECIFICATION

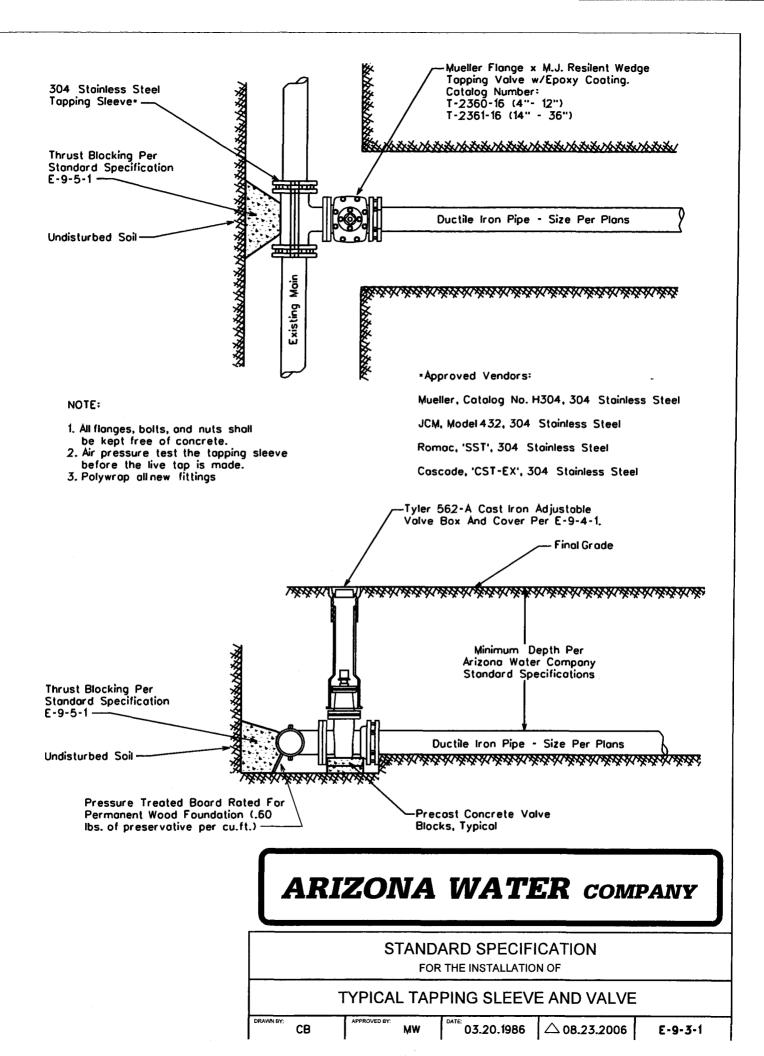
FOR THE INSTALLATION OF

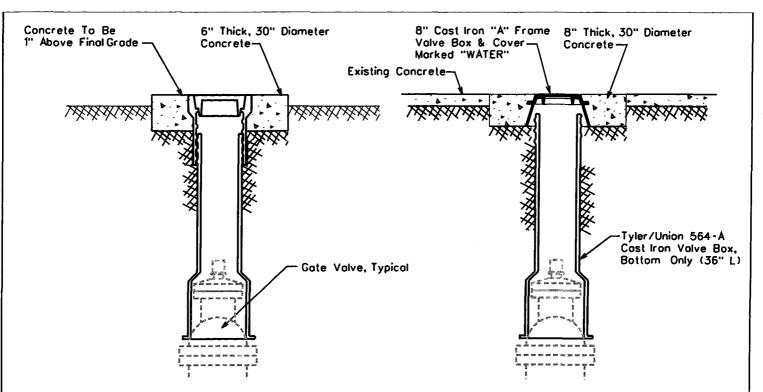
INSTALLATION OF BEVEL GEARED HORIZONTAL GATE VALVES WITHOUT A BY-PASS FOR 18" AND LARGER VALVES

DRAWN BY: APPROVED BY:

DATE:

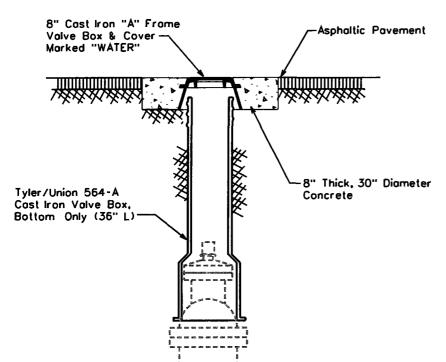
- / ^





NON-VEHICULAR VALVE BOX

CONCRETE VALVE BOX For Areas Subject To Vehicular Traffic



NOTE:

- 1. The Valve Box Shall Be Adjusted To Finished Grade Prior To Placing Of Asphalt And/Or Concrete.
- 2. For Non-Traffic Areas Use Tyler/Union 562-A, Two-Piece, 6855 Series Or Equivalent Adjustable Cast Iron Valve Box And Cover. Valves 4" To 12"

For Traffic Areas, Use Tyler/Union 564-A Bottom Section Only With An 8" Cast Iron "A" Frame With Cover. Valves 4" To 12"

- 3. All Valves Installed Five Feet (5') Deep And Greater Are To Be Installed With A Valve Operator Extension, Mueller Catalog No. A-26441 And Shall Have A Debris Cap
- 4. Use Minimum Class 'C' Concrete which is defined as concrete whose minimum compressive strength at 14 days reaches 1600psi and at 28 days reaches 2000psi. per MAG Section 725, Table 725-1.

ASPHALT VALVE BOX For Areas Subject To Vehicular Traffic

ARIZONA WATER COMPANY

STANDARD SPECIFICATION

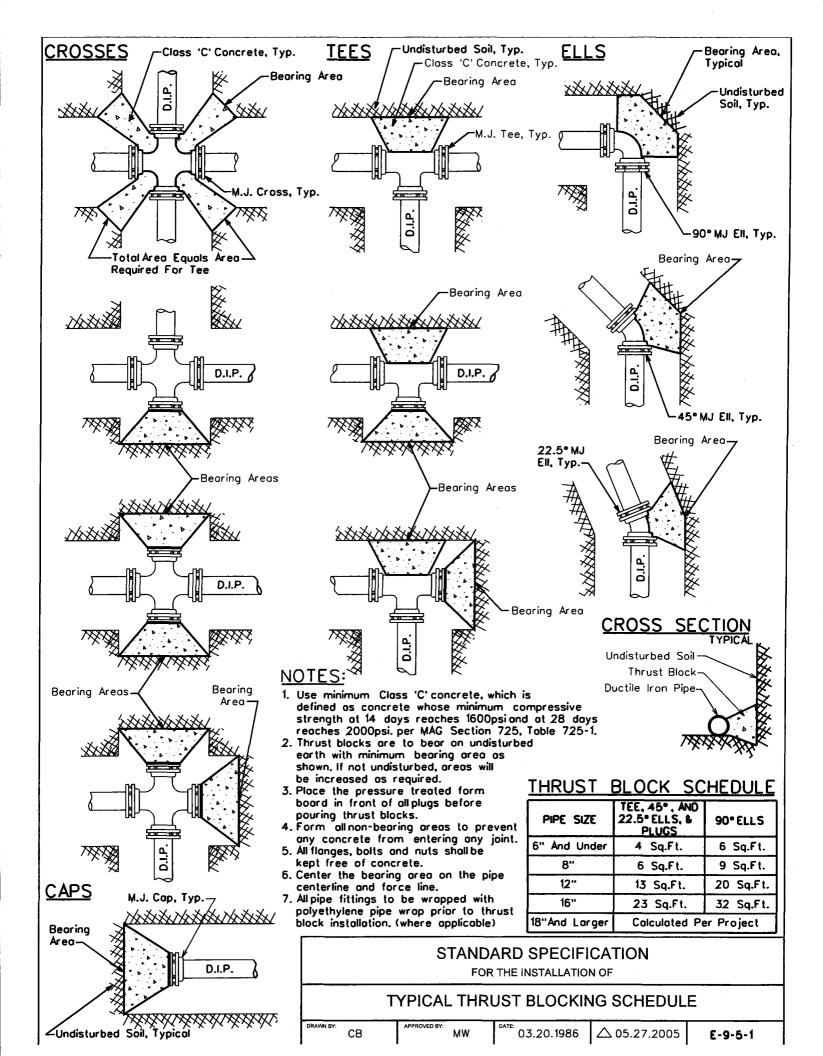
FOR THE INSTALLATION OF

TYPICAL VALVE SUBJECT TO NON-VEHICULAR AND VEHICULAR TRAFFIC

CB

03.20.1986 \ \triangle \ 8.24.2006

E-9-4-1

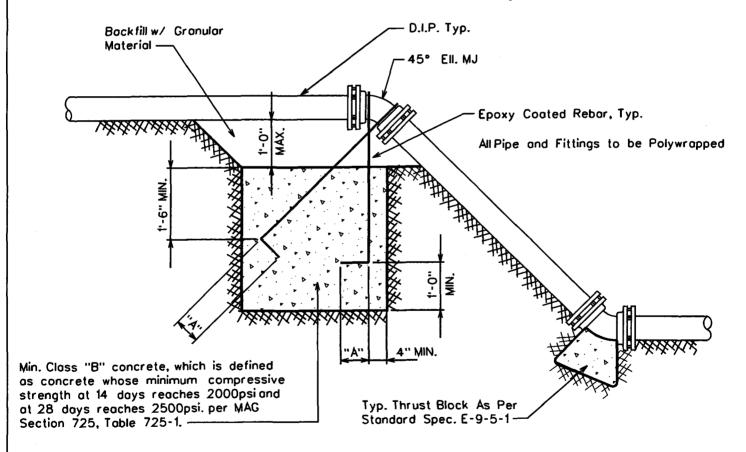


NOTES

- Bars in Conc. Thrust Block To Be Coated w/ 2 Coats Coal Tar Epoxy or by Other Approved Method.
- 2. Bars To Have 90° Hook © Their Ends, As Per Table Below.

Pipe Size	Min. Bar Size	"A" Dimension (Hook)	 Min. Block Dimension (WxHxL)
6"	•6	6"	3'x3'x3'
8"	•6	9"	4'x3'x4'
12"	•8	9"	5'x4'x5'
16"	•9	12"	7'x6'x7'

* For 125 P.S.I. Working Pressure



ARIZONA WATER COMPANY

STANDARD SPECIFICATION
FOR THE INSTALLATION OF

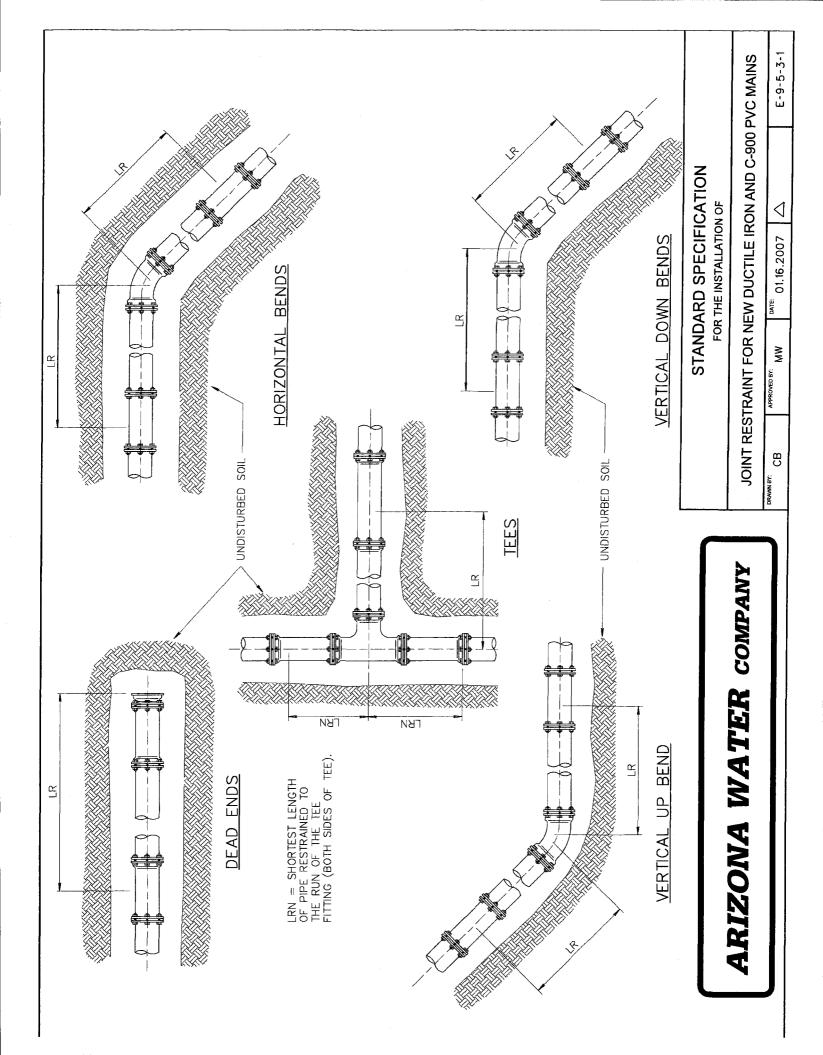
THRUST BLOCK FOR VERTICAL BENDS

JPK MJW

7-5-96

△ 01.16.2007

£-9-5-2



		DEAD			31	44	- α	000	η ά	00	104	17.0	126	147
							- ") ("	٦	10	,	T	-	-
		BEND FITTINGS	2	BEND	2	-C	9	α	o	5 2	1-	12	14	16
		22-1/2' BEN	I WAY C C	BEND	9	6	11	14	16	18	21	23	25	29
N PIPE	OFFSETS	FITTINGS	QII	BEND	7	10	13	9	0	212	24	96	28	33
RESTRAINED LENGTHS, LR, FOR DUCTILE IRON PIPE	VERTICAL OFFSETS	45° BEND	NWOO	BEND	13	18	24	29	34	38	43	48	52	61
	>	FITTINGS	dl	BEND	18	25	32	38	45	51	57	62	68	79
		90' BEND	NWCC	BEND	31	44	58	69	81	92	104	115	126	147
	ú			I RN=10'	8	20	34	45	57	68	79	06	100	121
		ובבט		I RN=0'	30	43	56	68	80	91	103	113	125	145
	0	BENDS			4	5	9	80	6	10	11	12	14	16
	 	NOMINAL HORIZONTAL BENDS SIZE		45.	7	10	13	16	19	21	24	26	28	33
	7,00			.06	18	25	32	38	45	51	57	62	68	79
	NOMINAL			INCHES	4	9	œ	10	12	14	16	20	20	24

		DEAD	FNDS))	7.0	102	123	200	159	187	214	170	266	200	787	040
YLENE WRAP		22-1/2° BEND FITTINGS		BFND	; ; ;	2	0	,		13	15	16	ά	200	200	777
		22-1/2° BEN	-	BEND	14	20	26	202	32	37	42	48	53	αĽ	8 8	O _O
OLYETH	OFFSETS	FITTINGS		BEND	=	15	19	20	67	27	31	34	38	41	47	,
WITH F	VERTICAL OFFSETS	45° BEND	NAMO	BEND	30	42	55	99	20	77	89	100	110	121	141	
RESTRAINED LENGTHS, LR, FOR DUCTILE IRON PIPE WITH POLYETHYLENE WRAP	Ν	90° BEND FITTINGS	dl	BEND	26	36	47	56	2	65	74	82	06	98	113	
		90. BEND	NWOO	BEND	72	102	133	150		187	214	241	266	292	340	
	Ų	<u> </u>		LRN=10'	8	47	78	10.3		131	156	183	207	233	280	
		IEES		LRN=0'	69	66	130	157		185	211	238	263	289	337	
		HORIZONTAL BENDS		22-1/2.	2	7	6	-	1.7	13	15	16	9	20	22	
	FINO			45.	11	15	19	23	100	/7	31	34	37	41	47	
	7001	100		.06	26	36	47	56	7.0	60	74	82	90	98	113	
	NOMINAL		71.0	INCHES	4	9	80	10	2.	7	14	16	18	20	24	

- 1. ALL JOINTS WITHIN THE SPECIFIED LENGTH LR MUST BE RESTRAINED. ALL LENGTHS ARE GIVEN IN FEET.
- 2. THE MAXIMUM TEST PRESSURE SHALL NOT EXCEED 200 PSI
- 3. THE MINIMUM DEPTH OF BURY SHALL BE 3' TO TOP OF PIPE.
- 4. RESTRAINED LENGTHS MAY BE REDUCED WHEN SUPPORTED BY ENGINEERING CALCULATIONS.

ARIZONA WATER COMPANY

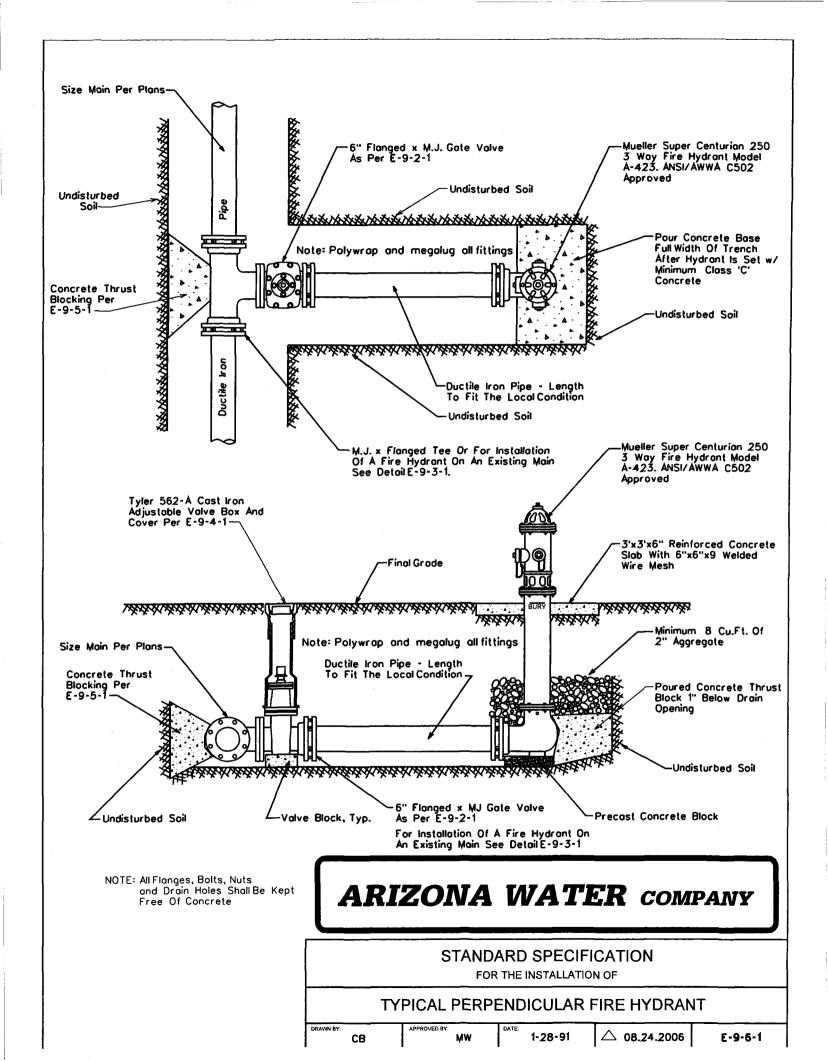
STANDARD SPECIFICATION FOR THE INSTALLATION OF

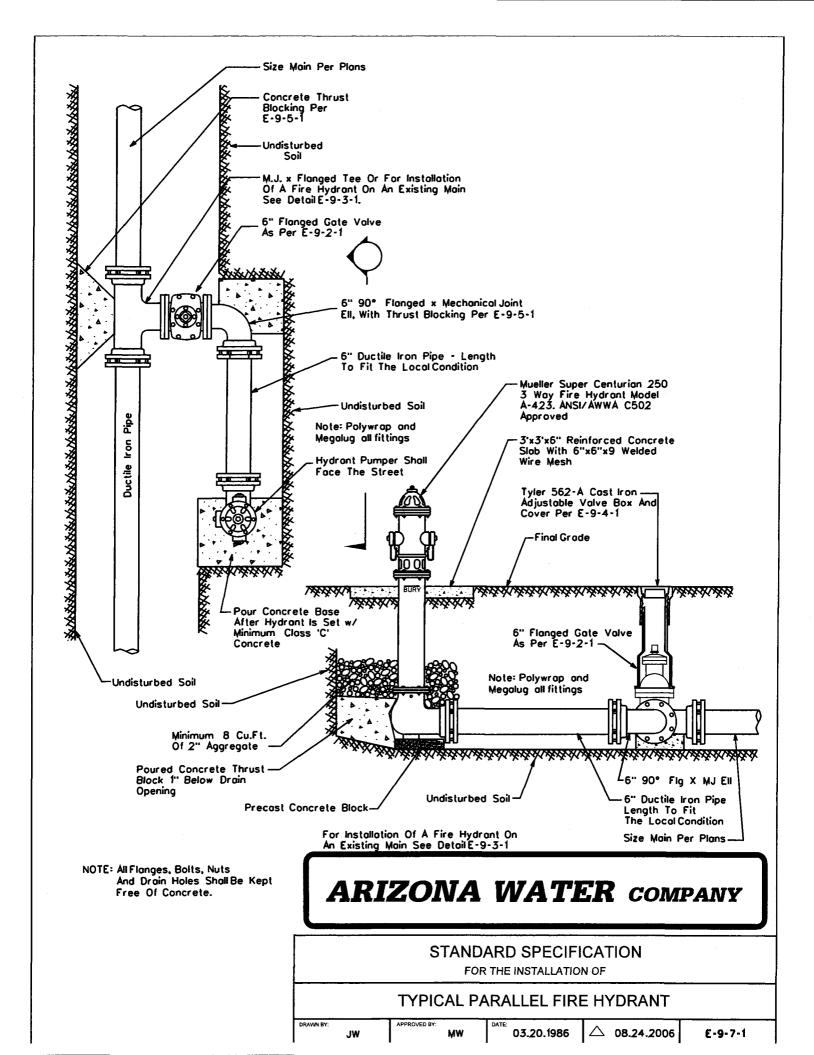
JOINT RESTRAINT FOR NEW DUCTILE IRON AND C-900 PVC MAINS

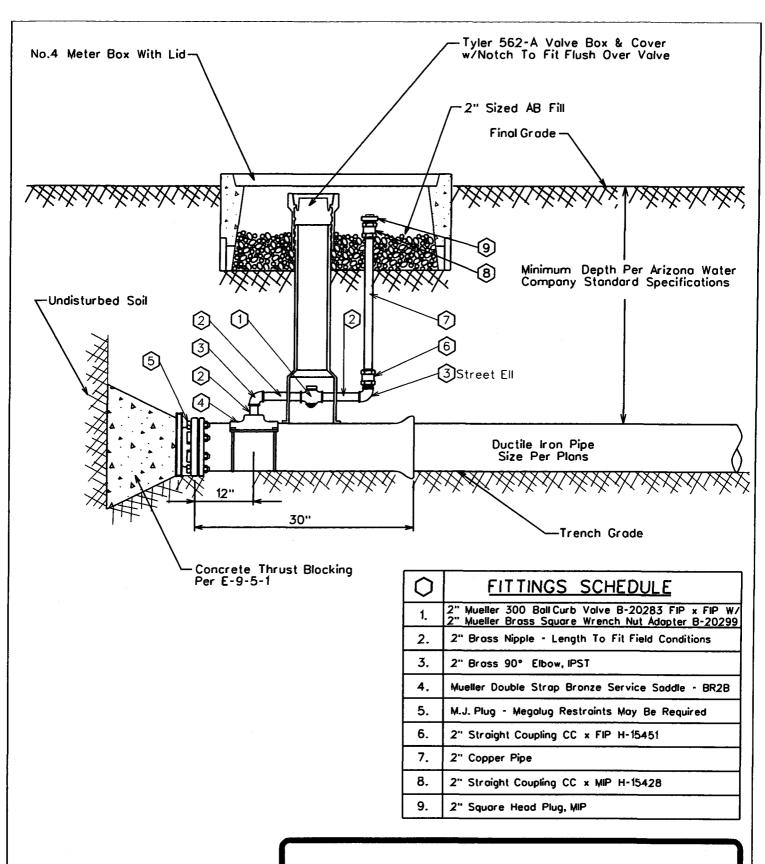
APPROVED BY: DRAWN BY: CB

DATE: 01.16.2007

E-9-5-3-2







ARIZONA WATER COMPANY

STANDARD SPECIFICATION

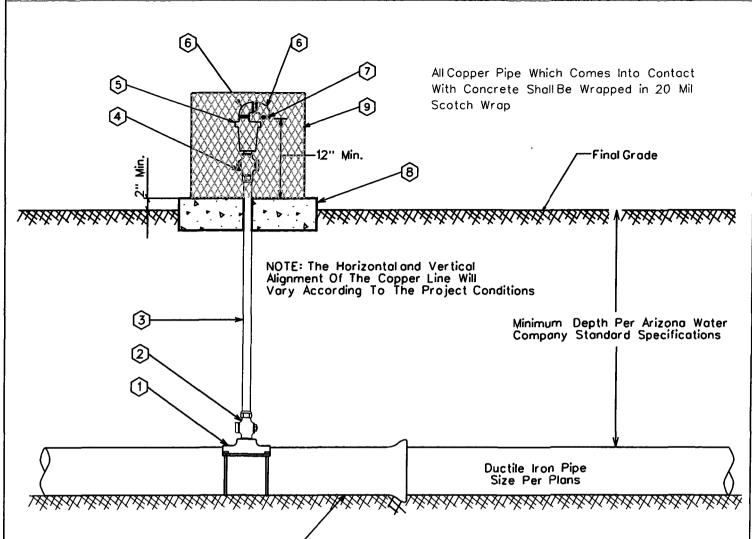
FOR THE INSTALLATION OF

2" BLOWOFF ASSEMBLY

CB APPROVED BY: MW DATE: 0.3.20.198

03.20.1986 | 🛆 03.21.2006

E-9-8-1



GENERAL NOTES:

 The valve shall be installed at high points and on long runs to vent the accumulation of air with the line under pressure- see the construction plans for specific locations.

Trench Grade

- 2. The valve shall have a 1/4 " orifice with valve sealing faces of stainless steel and BUNA-N rubber.
- 3. The valve shall be Crispin model AR10 for 6" and larger water mains.
- 4. Crispin model AR10 valve construction consists of a 1" IPST inlet & ½" IPST outlet, cast iron body and top flange with stainless steel float and trim.
- 5. The air release assembly shall be located out of the path of traffic but within right-of-way or easement.

0	FITTINGS SCHEDULE
1.	Mueller BR2B Bronze Service Saddle - Double Strap
2.	1" Mueller B-25008 Taper × Comp. Ball Corp Stop
3.	1" Type 'K' Copper w/NO Splices - Field Fit
4.	1" Mueller B-25028 IP × Comp. Ball Corp Stop
5.	Crispin 1" Air Release Valve, Model AR10
6.	1/2" Bross Street Elbow
7.	No.16 Wire Mesh Screen (Non-Corrodible)
8.	4" Thick Concrete Pad - Class 'C' Concrete
9.	Guardshack, Model GS-1, Available From BPDI, Inc. Available In Leaf Green Or Desert Tan

ARIZONA WATER COMPANY

STANDARD SPECIFICATION

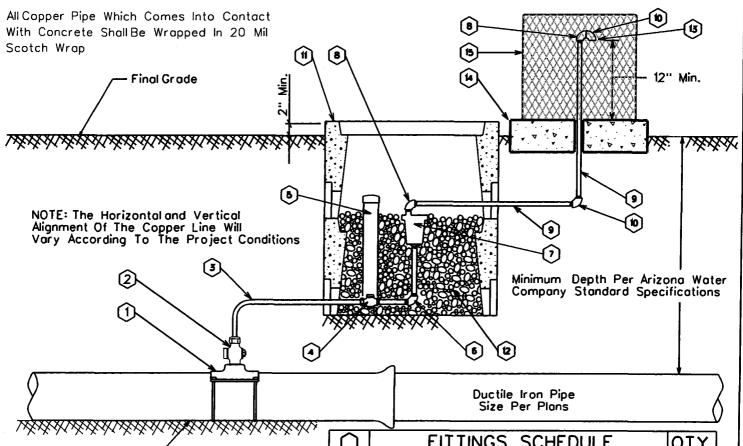
FOR THE INSTALLATION OF

TYPICAL AIR RELEASE VALVE

N BY: CB APPROVED BY: M

03.20.1997 🛆 08.24.2006

24.2006 E-9-8-



GENERAL NOTES:

Trench Grade

- 1. The valve shall be installed at high points and on long runs to vent the accumulation of air with the line under pressure- see the construction plans for specific locations.
- 2. The valve shall have a 1/4 " orifice with valve sealing faces of stainless steel and BUNA-N rubber.
- 3. The valve shall be Crispin model AR10 for 6" and larger water mains.
- 4. Crispin model AR10 valve construction consists of a 1" IPST inlet & 1/2" IPST outlet, cast iron body and top flange with stainless steel float and trim.
- 5. The air release assembly shall be located out of the path of traffic but within the right-of-way or easement.

FITTINGS SCHEDULE	QTY.
Mueller BR2B Bronze Service Saddle - Double Strap	1
1" Mueller B-25008 Toper x Comp. Ball Corp Stop	1
1" Type 'K' Copper w/NO Splices - Field Fit	As Req'd
1" Mueller B-25028 IP x Comp. Ball Corp Stop	1
3" PVC Pipe w/ Cap (Loose Fit)	1
1" × 4" Brass Nipple w/90° Elbow	1
Crispin 1" Air Release Valve, Model AR10	1
1/2" Bross Street Elbow	2
1/2" Galvanized Pipe - Length as req'd	2
1/2" Galvanized 90° Ell	2
Number 1 Meter Box	2
2" Sized AB (Fill Meter Box To The Top Of The Air Release Valve)	Ås Req'd
No.16 Wire Mesh Screen (Non-Corrodible)	1
4" Thick Concrete Pad - Class 'C' Concrete	1
Guardshack, Model GS-1, Available From BPDI, Inc. Available In Leaf Green Or Desert Tan	1
	Mueller BR2B Bronze Service Saddle - Double Strap 1" Mueller B-25008 Taper x Comp. Ball Corp Stop 1" Type 'K' Copper w/NO Splices - Field Fit 1" Mueller B-25028 IP x Comp. Ball Corp Stop 3" PVC Pipe w/ Cap (Loose Fit) 1" x 4" Brass Nipple w/90° Elbow Crispin 1" Air Release Valve, Model AR10 1/2" Bross Street Elbow 1/2" Galvanized Pipe - Length as req'd 1/2" Galvanized 90° Ell Number 1 Meter Box 2" Sized AB (Fill Meter Box To The Top Of The Air Release Valve) No.16 Wire Mesh Screen (Non-Corrodible) 4" Thick Concrete Pad - Class 'C' Concrete Guardshack, Model GS-1, Available From BPDI, Inc.

ARIZONA WATER COMPANY

STANDARD SPECIFICATION

FOR THE INSTALLATION OF

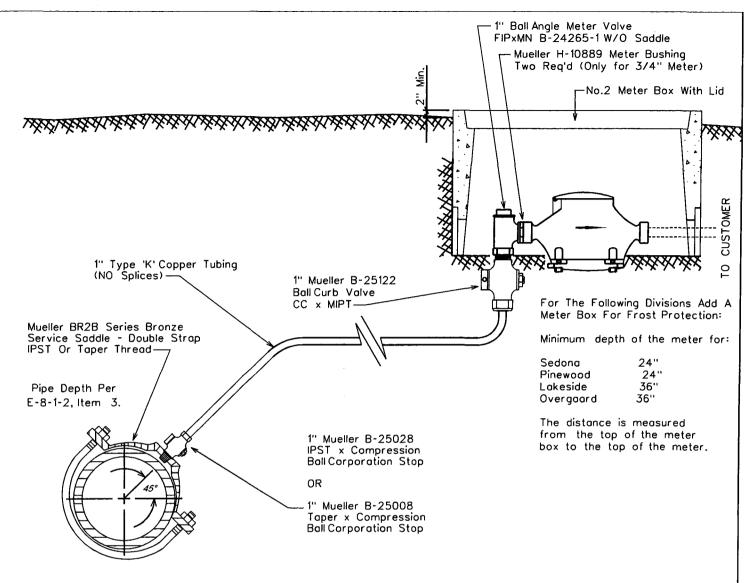
AIR RELEASE VALVE FOR THE NORTHERN REGION

MW

CB

03.20.1997 \(\triangle 08.24.2006 \)

E-9-8-3



SADDLE TAP TO CA, PVC, OR DIPIPE

NOTE: The minimum distance between taps on mains other than ductile iron is 12"

NOTE: Only the meter is supplied by Arizona Water Company

ARIZONA WATER COMPANY

STANDARD SPECIFICATION

FOR THE INSTALLATION OF

SINGLE SERVICE CONNECTION FOR A 3/4" OR 1" METER

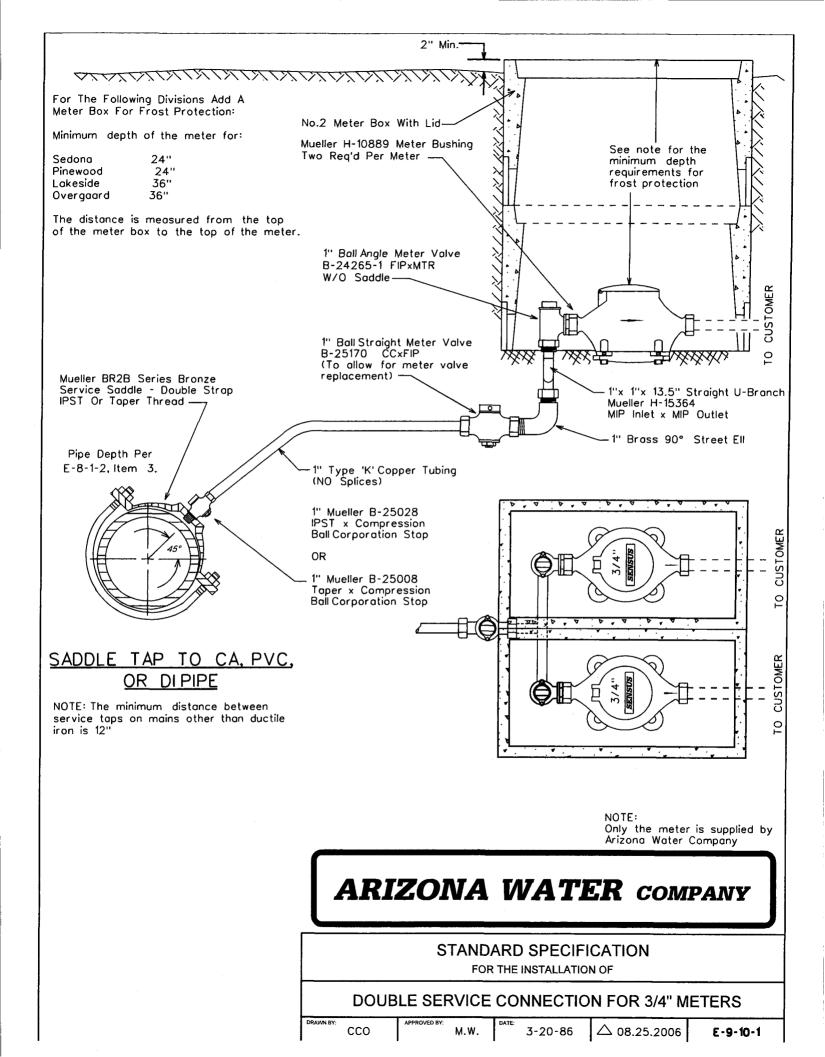
CCO APP

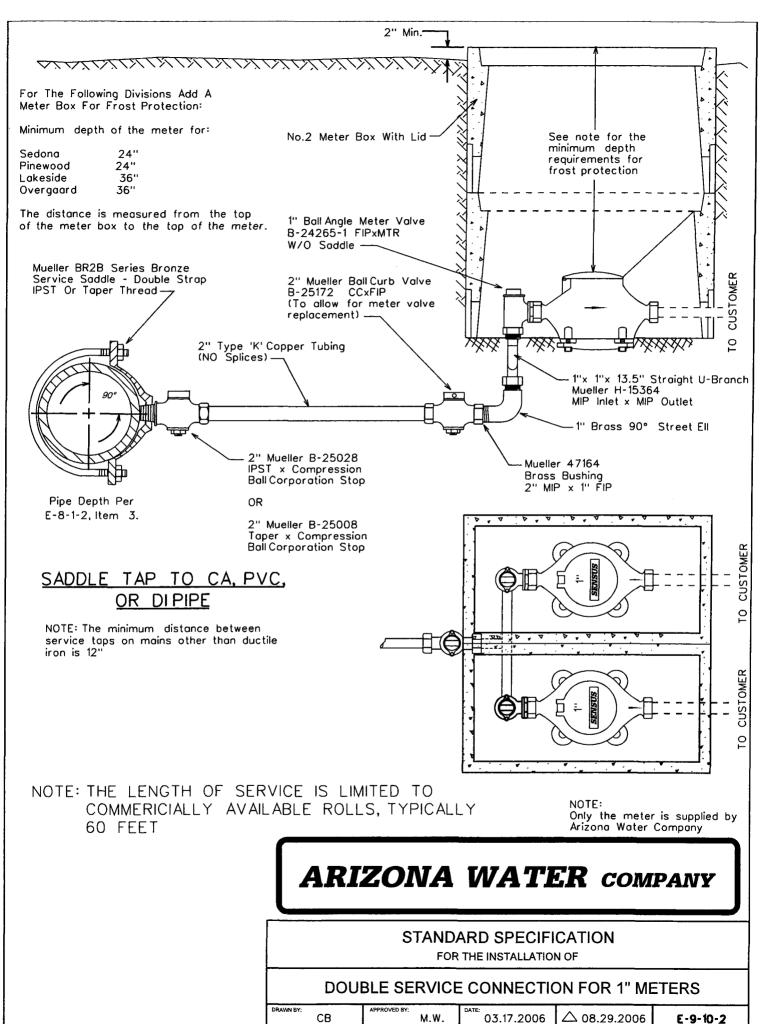
APPROVED BY:

3/20/86

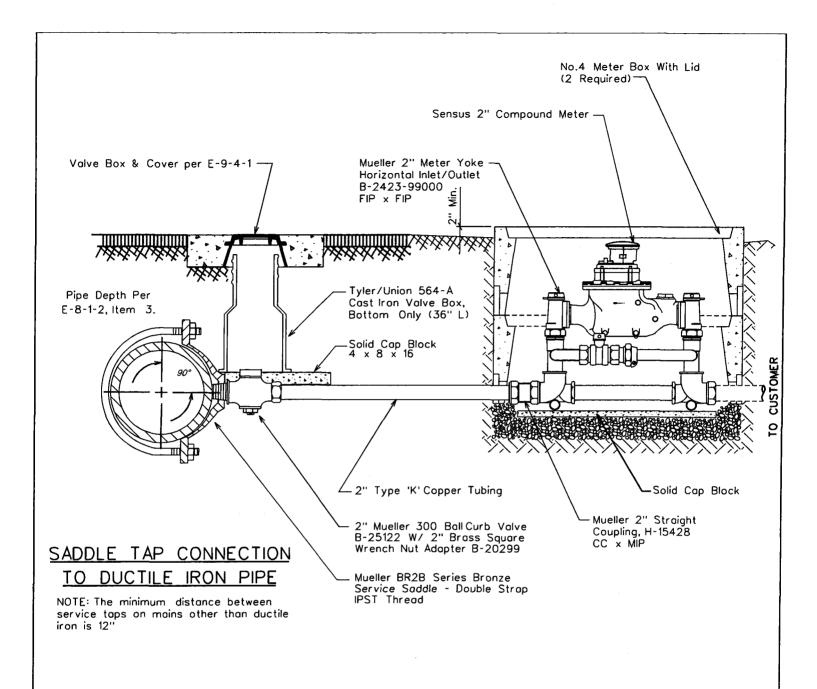
△ 03.17.2006

E-9-9-1





E-9-10-2



NOTE: THE LENGTH OF SERVICE IS LIMITED TO COMMERICIALLY AVAILABLE ROLLS, TYPICALLY 60 FEET

NOTE:

Only the meter is supplied by Arizona Water Company

E-9-11-1

ARIZONA WATER COMPANY

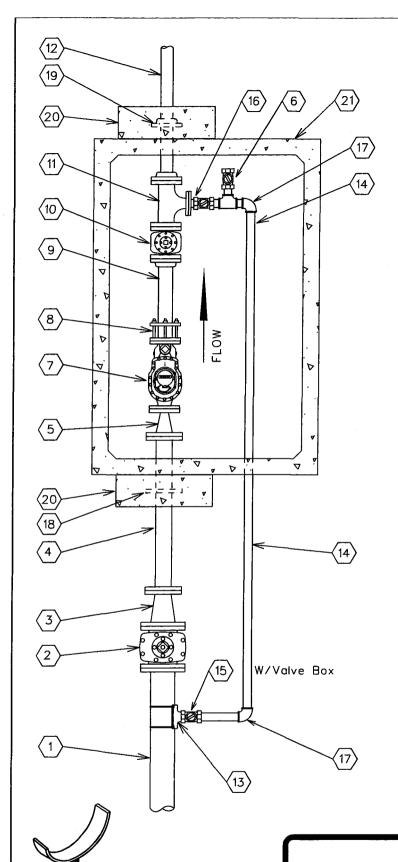
STANDARD SPECIFICATION

FOR THE INSTALLATION OF

TYPICAL 2" SERVICE CONNECTIONS

THEORET CERTICE CONTROL OF THE CONTR

NBY: JW APPROVED BY: M.W. DATE: 3/20/86 \(\triangle 08.29.2006 \)



Pipe Support

Conc. Block

No.	FITTINGS SCHEDULE			
1.	6" D.I.P.			
2.	6" G.V.B.&C. mj x flng			
3.	6"x4" Reducer fing x mj			
4.	4"x3'-0" D.I.P. Spool flng x pe			
5.	4" x 3" Reducer fing			
6.	2" Test Port			
7.	3" Compound Meter			
8.	3" F.C.A.			
9.	3"x2'-0" D.I. Spool fing x pe			
10.	3" Gate Valve fing			
11.	3"x2" Flg Tee w/ 2" Companion Flange			
12.	3"x4'-0" D.I. Spool fing x pe			
13.	6"x2" Tapping Saddle			
14.	2" Copper Pipe			
15.	2" Mueller B25122 Ball Valve w/B20299 Nut			
16.	2" Locking Ball Valve (normally closed)			
17.	2" Mueller H-15526 90° Ell CC x CC			
18.	4" Megalug			
19.	3" Slip-On Welding Flange			
20.	24"x24"x8" Conc. Thrust Block P.I.P.			
21.	575-LA Conc. Vault			

NOTE:

- 1. Use Rowley pipe supports or equivalent as needed (See detailbelow).
- 2. Pipe support locations to be determined by field personnel.
- 3. All copper pipe that comes in contact with concrete to be wrapped w/10-20 Mil. Scotchwrap corrosion protection tape.
- 4. All mechanical joint fittings are to be megalugged.
- 5. Use deflection fittings (45° Ells.) to achieve necessary depths & cover as shown on the standard specification for the installation of a concrete vault (E-9-12-5).

ARIZONA WATER COMPANY

STANDARD SPECIFICATION

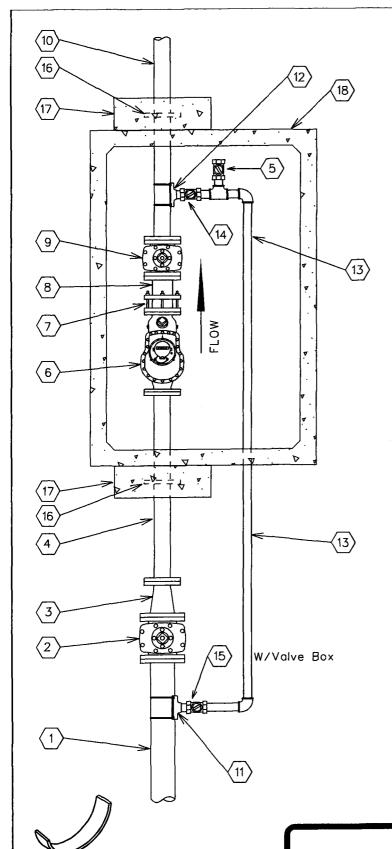
FOR THE INSTALLATION OF

3" COMPOUND METER

MW

CCO

^{DATE} 10/5/1993 △08.29.2006



Pipe Support

Conc. Block

No.	FITTINGS SCHEDULE			
1.	6" D.I.P.			
2.	6" G.V.B.&C. mj x flng			
3.	6"x4" Reducer fing x mj			
4.	4"x3'-0" D.I.P. Spool fing x pe			
5.	2" Test Port			
6.	4" Compound Meter			
7.	4" F.C.A.			
8.	4"x1'-0" D.I.P. Spool flng x pe			
9.	4" Gate Valve fing			
10.	4"x4'-0" D.I.P. Spool flng x pe			
11.	6"x2" Tapping Saddle			
12.	4"x2" Tapping Saddle			
13.	2" Copper Pipe			
14.	2" Ball Valve / Locking (Normally Closed)			
15.	2" Mueller B25122 Ball Valve w/B20299 Nut			
16.	4" Megalug			
17.	24"x24"x8" Conc. Thrust Block P.I.P.			
18.	575-LA Conc. Vault			

NOTE:

- 1. Use Rowley pipe supports or equivalent as needed (See detail below).
- 2. Pipe support locations to be determined by field personnel.
- 3. All copper pipe that comes in contact with concrete to be wrapped w/10-20 Mil. Scotchwrap corrosion protection tope.
- 4. All mechanical joint fittings are to be megalugged.
- 5. Use deflection fittings (45° Ells.) to achieve necessary depths & cover as shown on the standard specification for the installation of a concrete vault (E-9-12-5).

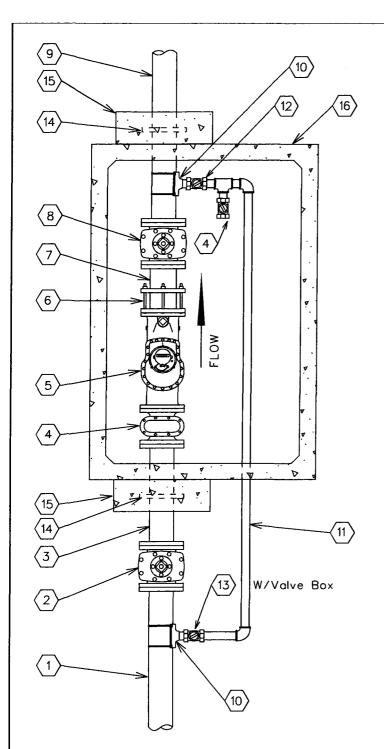


STANDARD SPECIFICATION FOR THE INSTALLATION OF

4" COMPOUND METER

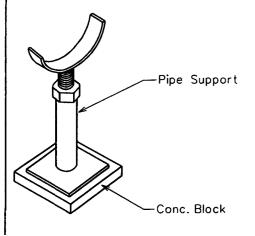
APPROVED BY: CCO

DATE: 10/5/1993 △08.29.2006



No.	FITTINGS SCHEDULE			
1.	6" D.I.P.			
2.	6" G.V.B.&C. mj			
3.	6"x 3'-0" D.I.P. Spool fing x pe			
4.	2" Test Port			
5.	6" Compound Meter			
6.	6" F.C.A.			
7.	6"x 1'-0" D.I.P. Spool flng x pe			
8.	6" Gate Valve fing			
9.	6"x 4'-0" D.I.P. Spool fing x pe			
10.	6"x2" Tapping Saddle			
11.	2" Copper Pipe			
12.	2" Ball Valve / Locking (Normally Closed)			
13.	2" Mueller B25122 Ball Valve w/B20299 Nut			
14.	6" Megalug			
15.	24"x24"x8" Conc. Thrust Block P.I.P.			
16.	575-LA Conc. Vault			

- Use Rowley pipe supports or equivalent as needed (See detail below).
- 2. Pipe support locations to be determined by field personnel.
- 3. All copper pipe that comes in contact with concrete to be wrapped w/10-20 Mil. Scotchwrap corrosion protection tape.
- 4. All mechanical joint fittings are to be megalugged.
- 5. Use deflection fittings (45° Ells.) to achieve necessary depths & cover as shown on the standard specification for the installation of a concrete vault (E-9-12-5).



ARIZONA WATER COMPANY

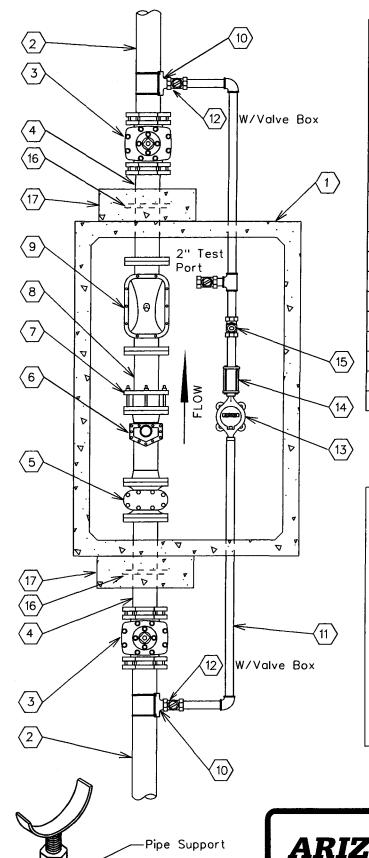
STANDARD SPECIFICATION

FOR THE INSTALLATION OF

6" COMPOUND METER

E-9-12-3

CCO APPROVED BY: MW DATE: 10/5/1993 \(\triangle 08.29.2006 \)



Conc. Block

No.	FITTINGS SCHEDULE
1.	575-LA Conc. Vault
2.	6" D.I.P.
3.	6" G.V.B.&C. m.j.
4.	6" x 3'-0" D.I.P. SPool Piece flng x pe
5.	6" Strainer
6.	6" Turbo Meter
7.	6" F.C.A.
8.	6" x 2'-0" D.I.P. Spool Piece flng x pe
	(TRIM SPOOL PIECE TO 3x THE PIPE DIA.)
9.	6" Detector Check
10.	6"x×N" Tapping Saddle
11.	*N" Copper Pipe
12.	∗N'' Ball Valve (Locking)
13.	*N" Meter
14.	∗N" Coup. Adapt.
15.	*N" Flapper Check Valve
16.	6" Megalug
17.	24"x24"x8" Conc. Thrust Block P.I.P.

*N - Size To Be determined By A.W.Co.

NOTE:

- Use Rowley pipe supports or equivalent as needed (See detail below).
- 2. Pipe support locations to be determined by field personnel.
- All copper pipe that comes in contact with concrete to be wrapped w/10-20 Mil. Scotchwrap corrosion protection tape.
- 4. All mechanical joint fittings are to be megalugged.
- 5. Use deflection fittings (45° Ells.) to achieve necessary depths & cover as shown on the standard specification for the installation of a concrete vault (E-9-12-5).
- 6. To change from a 6" service to a 4" service, change all listed 6" materials to 4" materials.

ARIZONA WATER COMPANY

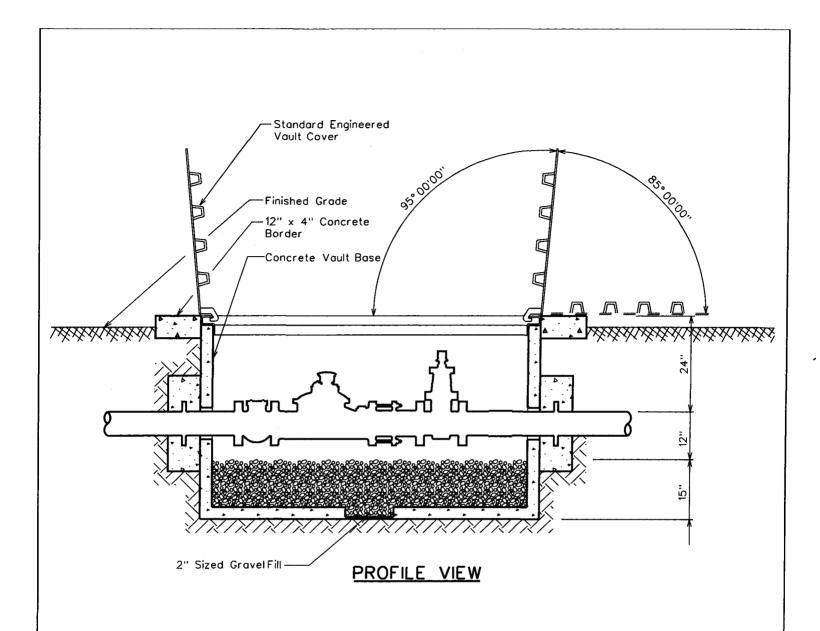
STANDARD SPECIFICATION

FOR THE INSTALLATION OF

6" COMPOUND SERVICE

OCO APPROVED BY: MW DATE: 10/05/1993

^{DATE:}10/05/1993 △08.29.2006



CONCRETE VAULT & COVER SPECIFICATIONS

Vault - Base No. 575-BL

Cover - Standard Engineered Vault Cover

- . 4874 Aluminum Diamond Plate Cover For Non-Traffic Loading Areas Or
- . 4874 Galvanized Steel Diamond Plate Cover W/ H-20 Traffic Loading
- . Double Torsion Spring Assisted Doors W/ Recessed Hasp & Safety Latches

NOTES

- . Total Depth Of Concrete Vault To Be A Maximum Of 3'-0" From Top Of Vault Cover To Top Of Gravel Fill.
- Cover To Top Of Gravel Fill.

 2. Service Connections Larger Than 6" In Diameter Will Conform To The Same Vault & Cover Specifications. Size Of Vault & Cover To Be Determined By A.W.Co. Engineers.

ARIZONA WATER COMPANY

STANDARD SPECIFICATION

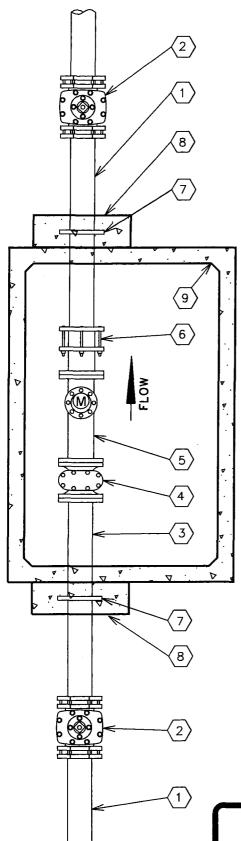
FOR THE INSTALLATION OF

CONCRETE VAULT

OCHOILL VACE

CCO

10/5/1993 🛆 05.17.2001



No.	FITTINGS SCHEDULE			
1.	Ductile Iron Pipe			
2.	Gate Valve M.J.			
3.	D.I.P. SpoolPiece Flg x Pe (10xDia.)			
4.	Meter Strainer			
5.	Propeller Meter			
6.	Flanged Coupling Adapter			
7.	Megalug Gland (Thrust Anchor)			
8.	Concrete Thrust Block P.I.P.			
9.	Concrete Vault			

- 1. Use Rowley pipe supports or equivalent as needed (See E-9-12-4).
- 2. Pipe support locations to be determined by field personnel.
- 3. All Sched. 40 Stl. pipe outside of vault to be wrapped w/10-20 Mil. Scotchwrap corrosion protection tape.
- 4. All mechanical joint fittings to are to be megalugged.
- 5. Use deflection fittings (45° Ells.) to achieve necessary depths & cover as shown on the standard specification for the installation of a concrete vault (E-9-12-5).

ARIZONA WATER COMPANY

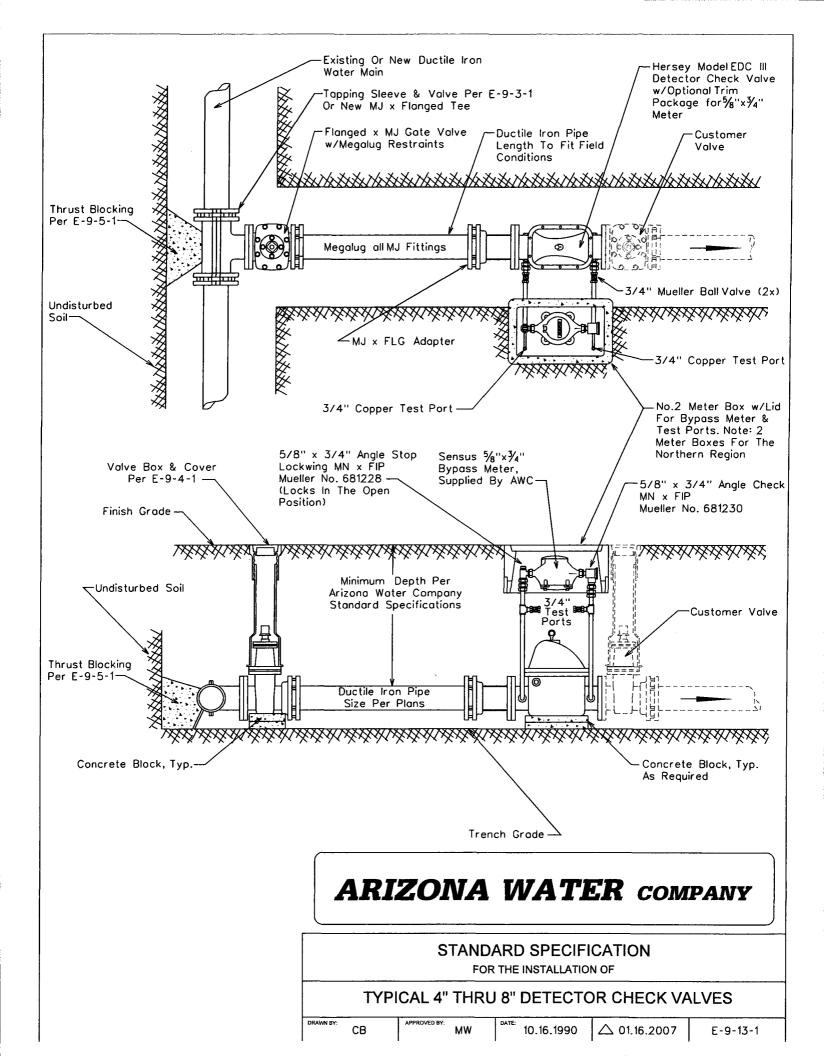
STANDARD SPECIFICATION

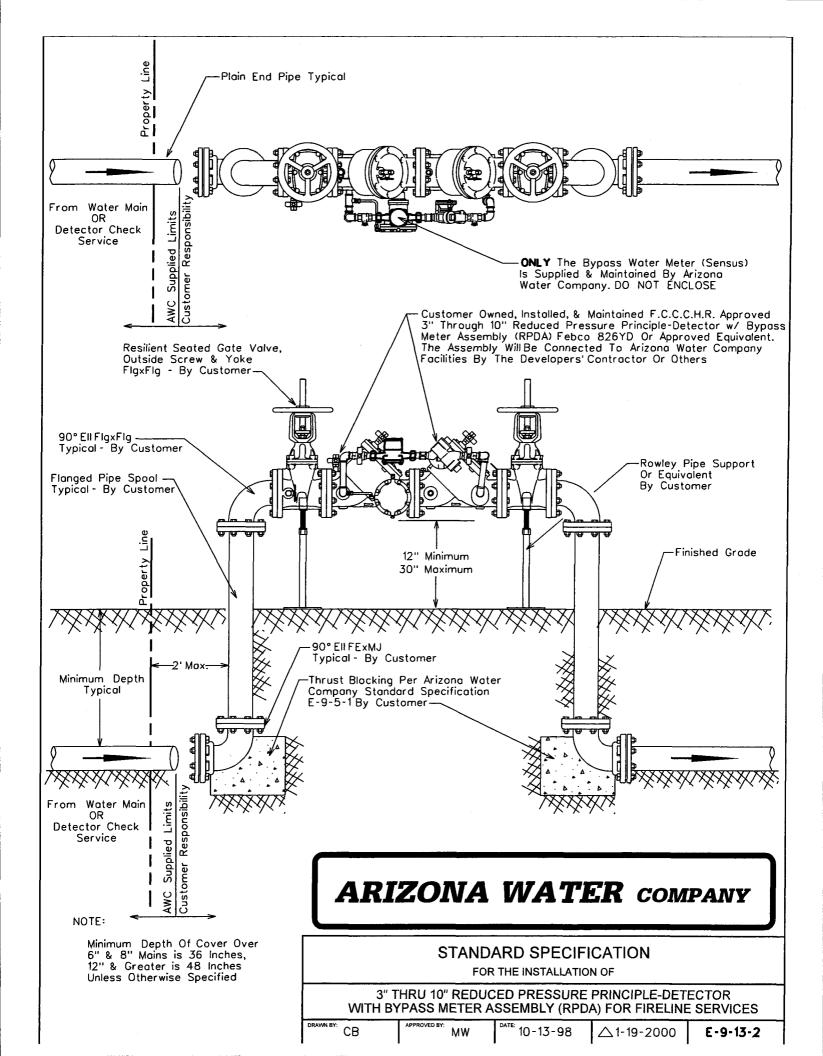
FOR THE INSTALLATION OF

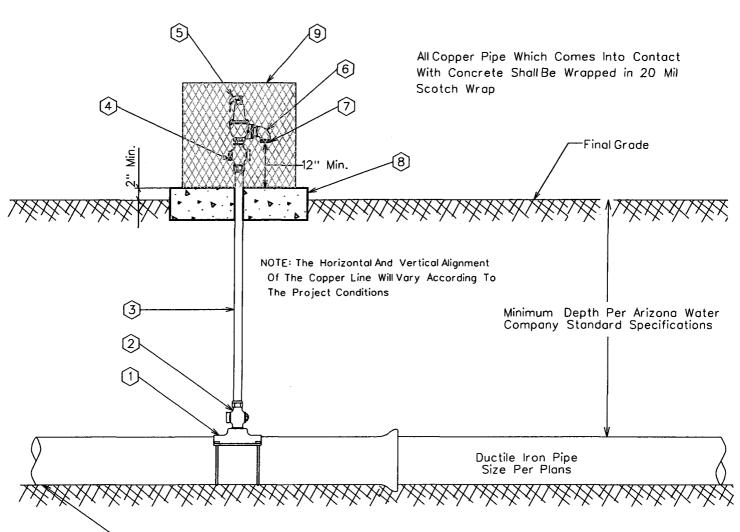
NON-POTABLE PROPELLER METER

JPK

APPROVED BY: MW DATE: 7-20-95 △







1. Pressure relief valves are typically located just down stream of a pressure reducing station or where system conditions might be subject to greater than allowable pressures.

-Trench Grade

2. The relief valve assembly and vandal enclosure shall be located out of the roadway, but within the right-of-way or easement.

	FITTINGS SCHEDULE
1,	Mueller BR2B Bronze Service Saddle - Double Strap
2.	2" Mueller B-25008 Taper x Comp. Ball Corp Stop
3.	2" Type 'K' Copper w/NO Splices - Field Fit
4.	2" Mueller B-25028 IP x Comp. Ball Corp Stop
5.	2" Pressure Relief Valve Watts 174A With A 2" Inlet / 2" Outlet 30-150 psi W/ Bronze Body
6.	2" Bross Street Elbow
7.	No.16 Wire Mesh Screen (Non-Corrodible)
8.	4" Thick Concrete Pad - Class 'C' Concrete
9.	Vandal enclosure to be centered on the concrete pad

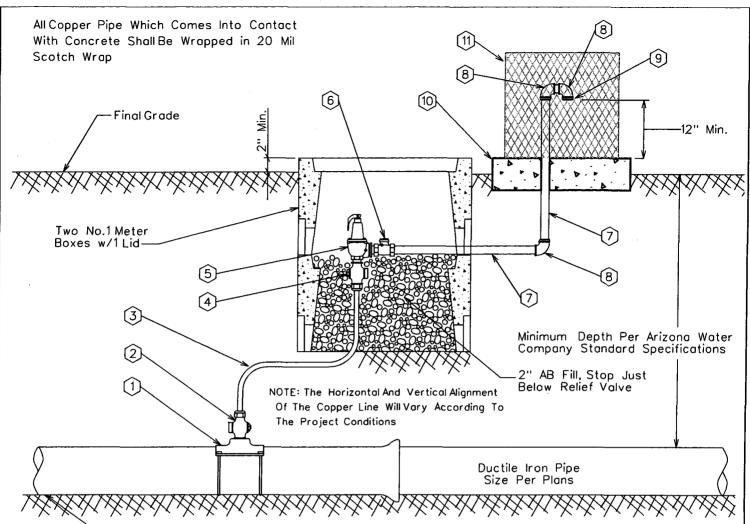
ARIZONA WATER COMPANY

STANDARD SPECIFICATION

FOR THE INSTALLATION OF

TYPICAL PRESSURE RELIEF VALVE ASSEMBLY

DRAWN BY: CCO APPROVED BY: MW DATE: 3/20/1986 \(\triangle 08.29.2006 \) E-9-14



—Trench Grade

- 1. Pressure relief valves are typically located just down stream of a pressure reducing station or where system conditions might be subject to greater than allowable pressures.
- 2. The relief valve assembly and vandal enclosure shall be located out of the roadway, but within the right-of-way or easement.

0	FITTINGS SCHEDULE			
1.	Mueller BR2B Bronze Service Saddle - Double Strap			
2.	2" Mueller B-25008 Taper x Comp. Ball Corp Stop			
3.	2" Type 'M' Rigid Copper w/NO Splices - Field Fit			
4.	2" Mueller B-25028 IP x Comp. Ball Corp Stop			
5.	2" Pressure Relief Valve Watts 174A With A 2" Inlet / 2" Outlet 30-150 psi W/ Bronze Body			
6.	2" Bronze Check Valve Watts Series CV			
7.	2" Schedule 40 Cut Pipe - Field Fit			
8.	2" Brass Street Elbow			
9.	No.16 Wire Mesh Screen (Non-Corrodible)			
10.	4" Thick Concrete Pad - Class 'C' Concrete			
11.	Guardshack, Model GS-1, Available From BPDI, Inc. Available In Leaf Green Or Desert Tan			

ARIZONA WATER COMPANY

STANDARD SPECIFICATION

FOR THE INSTALLATION OF

PRESSURE RELIEF VALVE - NORTHERN REGION

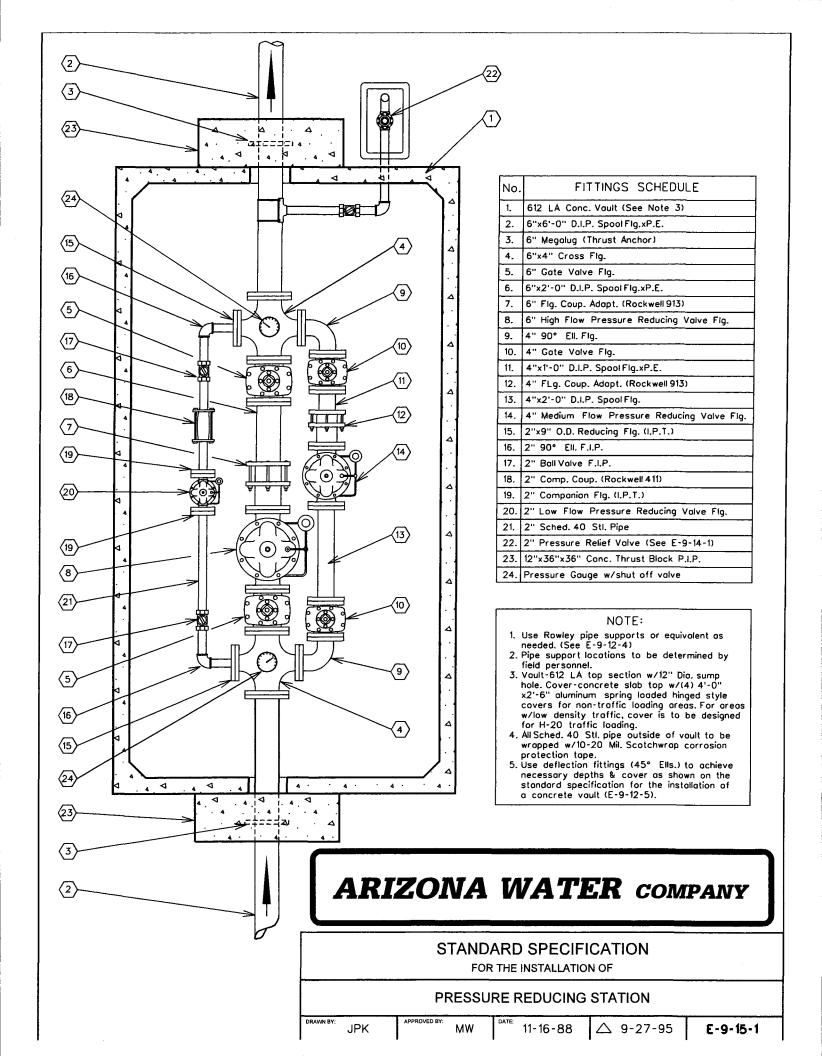
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V 5 3/20/

3/20/1986 △08.29.2006

£-9-14-2



- 1. Specific Items To Be Painted Deer-O Pure White Enamel:
 - A. All Booster Pumps.
 - B. All Electrical Motors And Gas Engines.
 - C. Well Pump Discharge Heads.
 - D. Electrical Panel.
- 2. Specific Items To Be Painted Frost Cap White Or Deer-O Pure White Enamel:
 - A. Well Shelter.
- 3. Specific Items To Be Painted OSHA Orange:
 - A. Electrical Conduit.
- 4. All Other Items To Be Painted With Either: (At Manager's Discretion)
 - A. Cholla Green
 - B. Forest Green C. Sonora Beige D. Red Rock

 - E. Rock Brown
 F. Deer-O Pure White
 G. Elkhorn Cactus

ARIZONA WATER COMPANY

STANDARD SPECIFICATION FOR THE INSTALLATION OF

PAINT COLOR SELECTION

APPROVED BY:

CCO

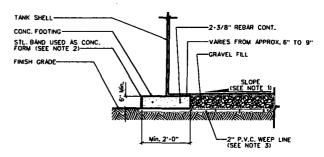
3/20/1986 🛆 2/13/2001 E-9-16-1

- 1. Tank shall conform to AWWA Specification 0100-84 with exceptions noted below.
- ·2. 1/4" minimun shell plate.
- 3. Minimum of 12" diameter roof vent, screened with No. 16 non-corrodate wire mesh, to be located on a 24" diameter round hinged manhole opening at the center of the tank to provide access to the dollar plate.
- 4. Overflow pipe shall be the same diameter as the inlet pipe and shall terminate 12 to 24 inches above splash pod or a minimum of 2 overflow pipe diameters above weir box high water level.
- 5. Storage tank shall be placed upon adequately compacted base material.
- 6. 6" minimum floor mounted tank drain outlet to be located close to the outer shell,
- Tank and related fittings shall be enclased with a 6 loot chain link fence with lockable gates and anti-personnel wire on top of fence.
- Liquid levelshall be indicated by a target and target board on the autside surface of the tank.
- 9. 24 inch diameter manholes shall be provided on the roof and on the shell near the bottom of the tank. The roof manhole cover shall overlop the manhole by at least 2 inches to provide a roin tight closure. Roof manhole shall be hinged and equipped with a lock. Shell manhole cover to be hinged and botted in place. "Tanks larger than a 80 foot diameter require 2 shell manholes.
- 10. Inside and outside ladders shall be located at the roof manhole. Outside ladder shall be caged with locking trap door. Bottom 8 feet of cage shall be enclosed to within ½" of shell with 10 gauge sheet steet.
- Finished tank shall be disinfected in accordance with Arizona Department of Health Services Engineering Bulletin No. B before being placed into service.
- 12. The following information will be included with application for approval to construct:
- 13. The storage tank will not be constructed within the 100 year flood plain and the tank site will be graded to slope away from the tank.
- The weided steel storage tank will be cooled as per AWWA Specification DIO2, and N.S.F. Standard 61.

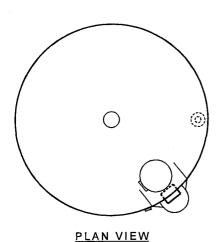
*Exceptions to AWWA Specification D100-84

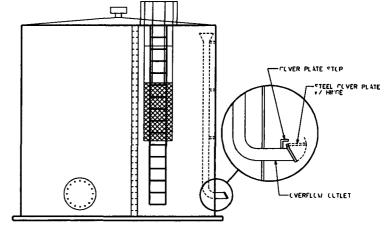
FOUNDATION NOTES

- 1. FINISH CONCRETE SURFACE MUST SLOPE UPWARDS FROM THE STEEL BAND APPROX. 1" IN 10'-0".
- 2. TOP OF STEEL BAND WUST BE MAINTAINED LEVEL TO WITHIN 1/8".
- 3. INSTALL 8-2" DIA.x10'-0" P.V.C. WEEP LINES, EQUALLY SPACED (EVERY 45'), PERFORATE 8'-0" OF LINE WITH "/2" DIA. HOLES ® 6" O.C. PLUG INTERIOR END OF LINE W/2" CAP.



FOUNDATION DETAIL





PROFILE VIEW

ARIZONA WATER COMPANY

STANDARD SPECIFICATION FOR THE INSTALLATION OF

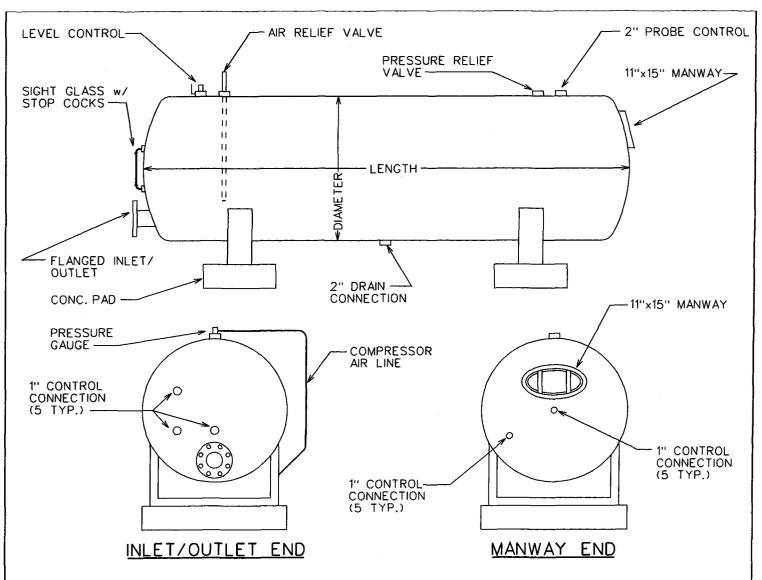
STEEL WATER STORAGE TANK

OTELL WATER OTORAGE TA

DRAWN BY:

JPK

E-9-17-1



- 1. ALL HYDROPNEUMATIC TANKS SHALL BE DESIGNED & CONSTRUCTED IN ACCORDANCE WITH THE CURRENT REQUIREMENTS OF THE ASME CODE FOR UNFIRED PRESSURE VESSELS, SECTION VIII, DIVISION 1.
- 2. FINISHED TANK SHALL BE DISINFECTED IN ACCORDANCE WITH ADEQ BULLETIN No. 8 BEFORE BEING PLACED INTO SERVICE.
- 3. THE WELDED STEEL HYDROPNEUMATIC TANK WILL BE COATED AS PER AWWA SPECIFICATION D102 & NSF STANDARD 61.
- 4. THE FOLLOWING INFORMATION WILL BE INCLUDED WITH THE APPLICATION FOR APPROVAL TO CONSTRUCT.
- 1. Tank Location
- 2. Tank Length
- 3. Tank Diameter _____
- 4. Tank Capacity _____
- 5. Maximum Working Pressure ___

ARIZONA WATER COMPANY

STANDARD SPECIFICATION

FOR THE INSTALLATION OF

HYDROPNEUMATIC TANK

DRAWN BY: JPK APPROVED BY: MW DATE: 3-20-1986 \(\triangle 01.16.2007 \) E-9-18-1

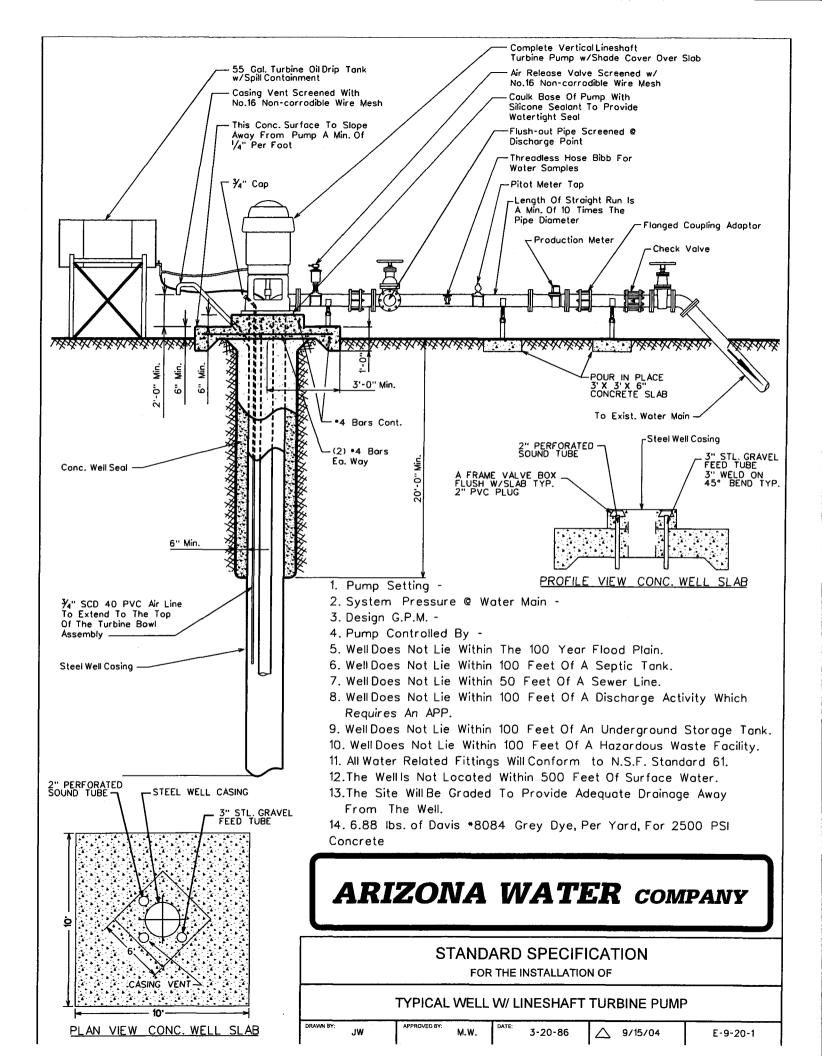
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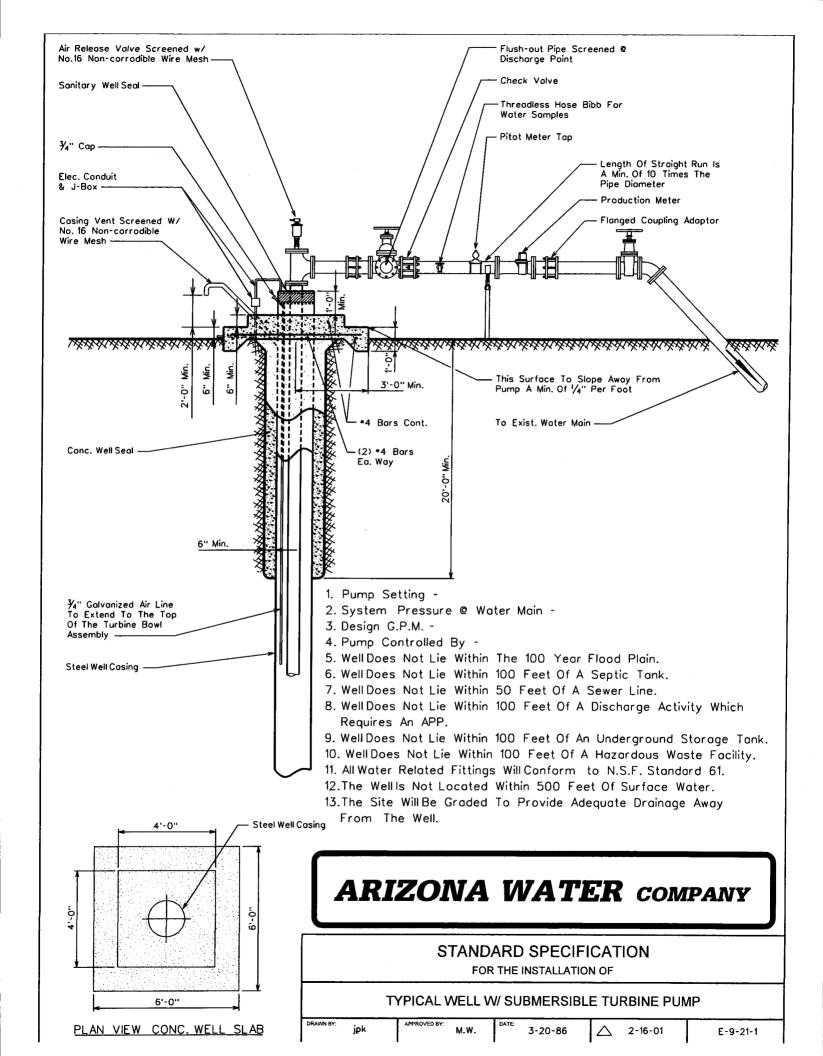
ARIZONA WATER COMPANY

STANDARD SPECIFICATION FOR THE INSTALLATION OF

WELL SHELTER

DATE 03.20.1986 \(\triangle 04.03.2001 \) **E-9-19-1**





All New Purchases To Conform To The Following:

Column Pipe

Oil Tube - Peerless Type

```
1\bigsymbols_2" O.D. - 14 Threads Per Inch Right Hand
2" O.D. - 12 "" "" "" ""
2\bigsymbols_2" O.D. - 10 "" "" "" "" ""
3" O.D. - 10 "" "" "" "" ""
4" O.D. - 10 "" "" "" "" ""
```

Line Shaft

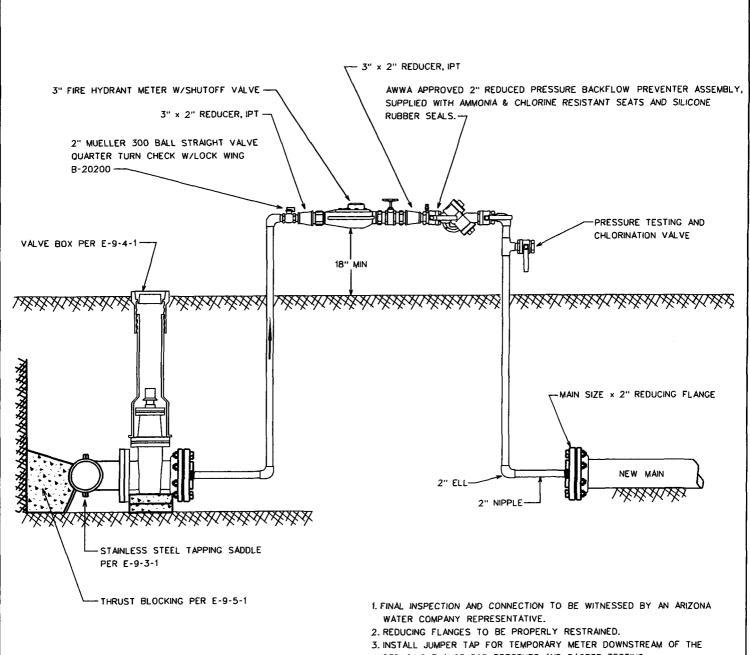
```
3/4" O.D. - 10 Threads Per Inch Left Hand
1" O.D. - 14 " " " " "
1-3/16" O.D. - 10 " " " " "
1-1/2" O.D. - 10 " " " " "
1-11/16" O.D. - 10 " " " " "
1-15/16" O.D. - 10 " " " " "
2-3/16" O.D. - 10 " " " " " "
```

ARIZONA WATER COMPANY

STANDARD SPECIFICATION FOR THE INSTALLATION OF

COLUMN PIPE, OIL TUBE AND LINE SHAFT

DRAWN BY: CCO APPROVED BY: DATE: 3/20/1996 \(\triangle 2/13/2001 \) E-9-22-1



- REDUCING FLANGE FOR PRESSURE AND BACTEE TESTING.
- 4. JUMPER ASSEMBLY MUST BE A MINIMUM OF 18" ABOVE FINISHED GRADE.
- 5. BACKFLOW ASSEMBLY REQUIRES CERTIFICATION.
- 6. ASSEMBLY NOT TO BE REMOVED AND SPOOL PIECE INSTALLED FOR FINAL CONNECTION UNTIL ALL TESTING, BACTERIAL CLEARANCE AND FINAL INSPECTIONS HAVE BEEN OBTAINED.
- 7. ALL NEW PIPING SHALL BE PROPERLY RESTRAINED.

ARIZONA WATER COMPANY

STANDARD SPECIFICATION

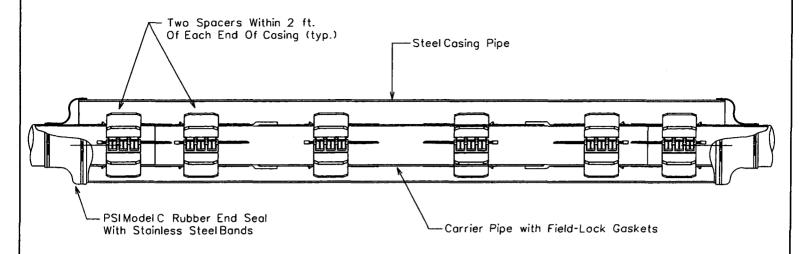
FOR THE INSTALLATION OF

HOT TAP & JUMPER METER CONNECTION

CB

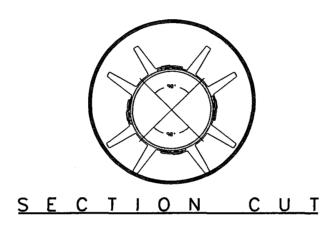
05.14.2004

E-9-23-1



CROSS SECTION

The casing spacers shall be the PSI Ranger II Casing Spacers as manufactured by Pipeline Seal and Insulator, Inc., Houston, Texas.



End Seals

After insertion of the carrier pipe into the casing, the ends of the casing shall be closed by installing 1/8" thick synthetic rubber end seals equal to the PSI Model "C" end seal as manufactured by Pipeline Seal and Insulator, Inc., Houston, Texas.

NOTE: The Carrier Pipe Shall Be Polywrapped Prior To The Skid Installation & Insertion Into The Carrier Casing For Divisions Requiring Polywrapped Pipe.

OD Push On Joint Bell	OD M.J. BELL
6" - 8.66"	6" - 11.12"
8" - 10.82"	8" - 13.37"
12" - 15.05"	12" - 17.94"
16" - 19.74"	16" - 22.56"
20" - 23.98"	20" - 27.08"
24" - 28.16"	24" - 31.58"
30" - 35.40"	30" - 39.12"
36" - 41.84"	36" - 46.00"
48" - 55.94"	48" - 60.00"

*Thickness Of Skid To Extend A Minimum of $\frac{1}{2}$ " Above The O.D. Of The Pipe Bell or Gland.

PIPE SIZE	CASING SIZE	CASING SIZE ID	CASING SCHEDULE	WALL THICKNESS	SKID SIZE
6''	16''	15.25"	STD.	.375	*x4x12
8''	18"	18.25"	STD.	.375	*x4x12
12''	22"	21.25"	STD.	.375	*x4x12
16''	28"	27.25"	STD.	.375	*×4×12
20"	32''	31.25"	STD.	.375	*x4x12
24''	36"	35.25"	STD.	.375	*x4x12
30"	48"	47.25"	STD.	.375	≖x4x12
36''	54"	53.25"	STD.	.375	*x4x12
48''	66''	65.25"	`STD.	.375	*x4x12

ARIZONA WATER COMPANY

STANDARD SPECIFICATION

FOR THE INSTALLATION OF

TYPICAL WATER LINE ENCASEMENT

DRAWN BY: DATE: 7 (00 (1000 A 00 07 0000 F)

CALCIUM HYPOCHLORITE TABLET CHLORINATOR FEEDER SPECIFICATIONS

SCOPE - This specification describes a ARCH Chemicals Calcium Hypochlorite Tablet Chlorination System as manufactured by ARCH Chemicals, 501 Merritt Seven, P.O. Box 5204, Norwalk, CT, 06856-5204.

DESCRIPTION - The chlorination system shall be completely assembled, ready to install. The chlorination system shall be a ARCH Chremitate Saletum Hyporohorite Tablet Fredets, or its equivalent, and shall be supplied with all its components factory mounted.

COMPONENTS - The Chlorination system shall have the following components:

A. 1-3/* RCRCH Chemical solid calcum hypochlorife tablet feeder

B. Polyethylene system enclosure

C. Integrated, level controlled solution tank

D. Adjustable flow control valve

E. Manual or porfor tayler fair inet;

F. Chemical metering pump

F. Chemical metering pump

A. Wasterproof electrical junction box

I. Corrosion resistant sedeute 40 piping

J. Reverse flow check valves

K. Total solution output control valve

ELECTRICAL FIXTURES - The following electrical inclures shall be provided:
A. Safety swith: 2 Pole, fused for 30 Amps, for 120 Volts, 80 cycle, single phase power.

CHLORINATOR DESIGN - The chlorination facility shall be designed and constructed in accordance with Artona State Department of Health Engineering Bulletin Number 8 - "Disinfection of Water Systems: Latest Revision.

CHLORINATION EQUIPMENT - The chlorination equipment shall be a ARCH Chemicals Calcium Hypochlorite tablet chlorinator, approved by NSF Standard 61.

CHLORINATOR OPERATION - The chlorination facility shall be operated in accordance with Arizona State Department of Health Engineering Bulletin Number 6, 'Disinfection of Water Systems', Table 1, Elest ewision.

— ARCH Chemicals tablet chlorinator systems incorporate a patented chornator within steasing to utilize ARCH Chemicals — 1.7. stoil cactium hypochlorite tablets (Approved NSF Standard 60). Meets AWWA Standard Standard 60). Meets AWWA Standard 60: Post CFP ARCH 178. The chlorinator is mounted on a polyethyle respetant choice. The initial water is spanyer on the calculum hypochlorite tablet and collected in a solution tank. This chlorinated solution is then pumped out of the tank through a chemical metering pump. This metering pump is then adjusted to obtain the desired CL residual. CHLORINATOR SYSTEM DESCRIPTION - ARCH Chemicals tablet chlorinator

ARCH Chemicals Calcium Hypochlorite Tablet Chlorinator

HYPOCHLORINATOR COMPONENTS:

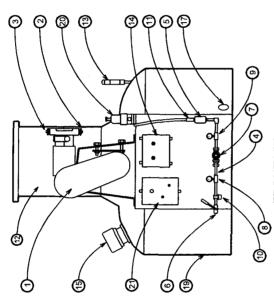
Chemical Metering Pump
 Pump Suction Connection
 Fund Dischage Connection
 Inlet Water Assembly
 Inlet Water Solenoid Valve
 Inlet Water Solenoid Valve

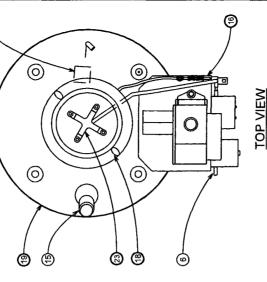
6. Inlet Shut-Off Valve
7. Inlet Pressure Regulator
8. Inlet Water Pressure Gauge
9. Spray Nozzie Water Pressure Gauge
10. Inlet Strainer
11. Inlet Tubing Connection

12. Dry Chemical Hopper 13. Suction Line 14. Electrical Control Box With Power On/Off 15. Electric Mixer 16. Solution Discharge Connection 17. Tank Drain Valve

18. Observation Port 19. Mixed Chemical Holding Tank 20. Pressure Relief Valve 21. Pump Speed Control 22. High Level Shru-Chif Float Switch 23. Walter Spray Nozzles

(3)

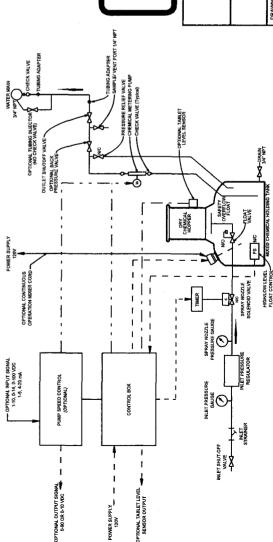




FRONT VIEW

HOPPER REMOVED FOR CLARITY

Chlorinator Fluid Schematic

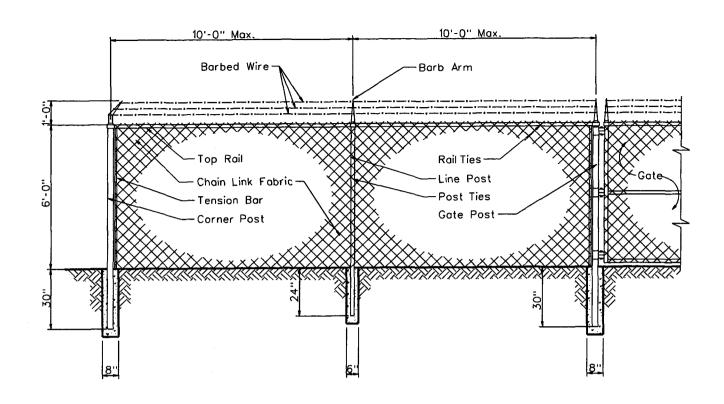


ARIZONA WATER COMPANY

STANDARD SPECIFICATION FOR THE INSTALLATION OF

CALCIUM HYPOCHLORITE TABLET CHLORINATOR

		E-9-25-1
		\triangleleft
	DATE	02-09-2000
	APPROVED BY:	ΜW
	DRAWN BY:	89
_		



Line Post: 1-7/8" O.D. 1.74 lbs. P/L.F. ASTM A-256

End Post: 2-7/8" O.D. 4.64 lbs. P/L.F. ASTM A-256

 Corner Post:
 2-7/8" O.D.
 4.64 lbs. P/L.F.
 ASTM A-256

 Gate Post:
 2-7/8" O.D.
 4.64 lbs. P/L.F.
 ASTM A-256

Top Roi: 1-5/8" O.D. 4.64 lbs. P/L.F. ASTM A-256

Chain Link Fabric: 9 Ga. 2" Mesh Galv. Before Weave

Selvage: Barb/Knuckle

Fillings: Pressed Steel

Barb Wire: 2-1/2 Ga./2 Point

Borb Arm: 1 Piece/45° Arm

Tension Wire: 9 Ga./Galv.

Line Post Set: 6"x24" In Concrete

Terminal Post Set: 8"x30" In Concrete

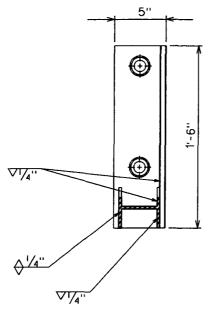
ARIZONA WATER COMPANY

STANDARD SPECIFICATION

FOR THE INSTALLATION OF

CHAIN LINK FENCE

CCO APPROVED BY: MW DATE: 7/7/1992 \(\triangle \triangle 2/9/2001 \) E-9-26-1

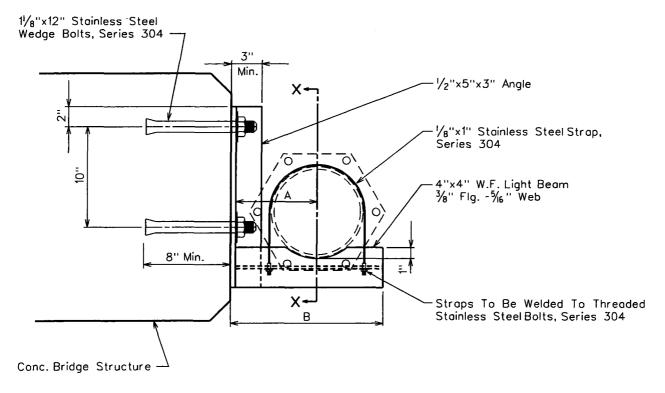


SECTION X-X

NOTES

- 1. Minimum 2 Supports Per Joint Of Pipe.
- 2. All Bolts Shall Have A Lock Washer Under The Nut.
- 3. All Nuts Shall Be Stainless Steel Series 304.

PIPE SIZE	Α	В
8''	8"	15"
10''	9"	17''
12''	10''	19''



SUSPENSION DETAIL

ARIZONA WATER COMPANY

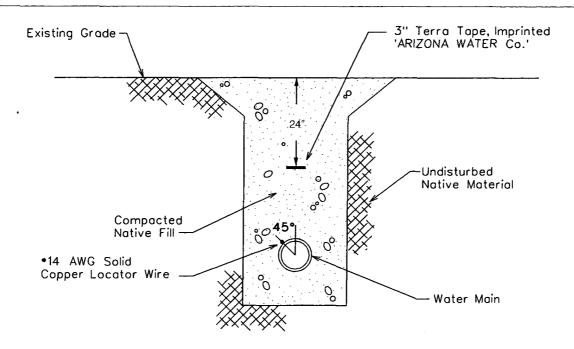
STANDARD SPECIFICATION

FOR THE INSTALLATION OF

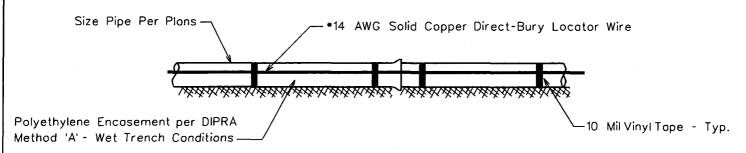
SIDE HUNG WATER LINE SUSPENSION

SIDE HUNG WATER LINE SUSPENSION

JPK APPROVED BY: MJW DATE: 7-12-96 △ E-9-27-1



TYPICAL WATER TRENCH DETAIL



TYPICAL PROFILE VIEW

WIRE GENERAL NOTES:

- All pipe shall have *14 AWG Solid Copper Direct-Bury Locator Wire Installed Directly To The Polywrap At 45° From The Vertical Center Of The Pipe and Shall Be Attached Using 10 Mil Vinyl Tape.
- 2. The Locating Wire Shall Terminate At the Top Of Each Valve Box and Be Capable of Extending 12" Above the Top Of The Box In Such A Manner So As Not To Interfere With Valve Operation.

TAPE GENERAL NOTES:

- 1. Use Terra Tape 3" Marking Tape As Manufactured By Reef Industries Inc. Of Houston, Texas (1-800-231-2417)
- 2. The Tape Is Blue & Imprinted 'ARIZONA WATER Co.'
- 3. INSTALLATION: The Pipe Warning Tape Shall Be Installed Over All Water Mains And Shall Be Buried 24 Inches Below The Surface Over The Center Of The Pipe.
 A) The Backfill Shall Be Sufficiently Leveled So That The Tape Is Installed On A Flat Surface.
- B) The Tape Shall Be Centered In The Trench With The Printed Side Up.
- C) Care Shall Be Exercised To Avoid Movement Of The Tape While The Remaining Backfill Is Moved Into The Trench.

ARIZONA WATER COMPANY

STANDARD SPECIFICATION

FOR THE INSTALLATION OF

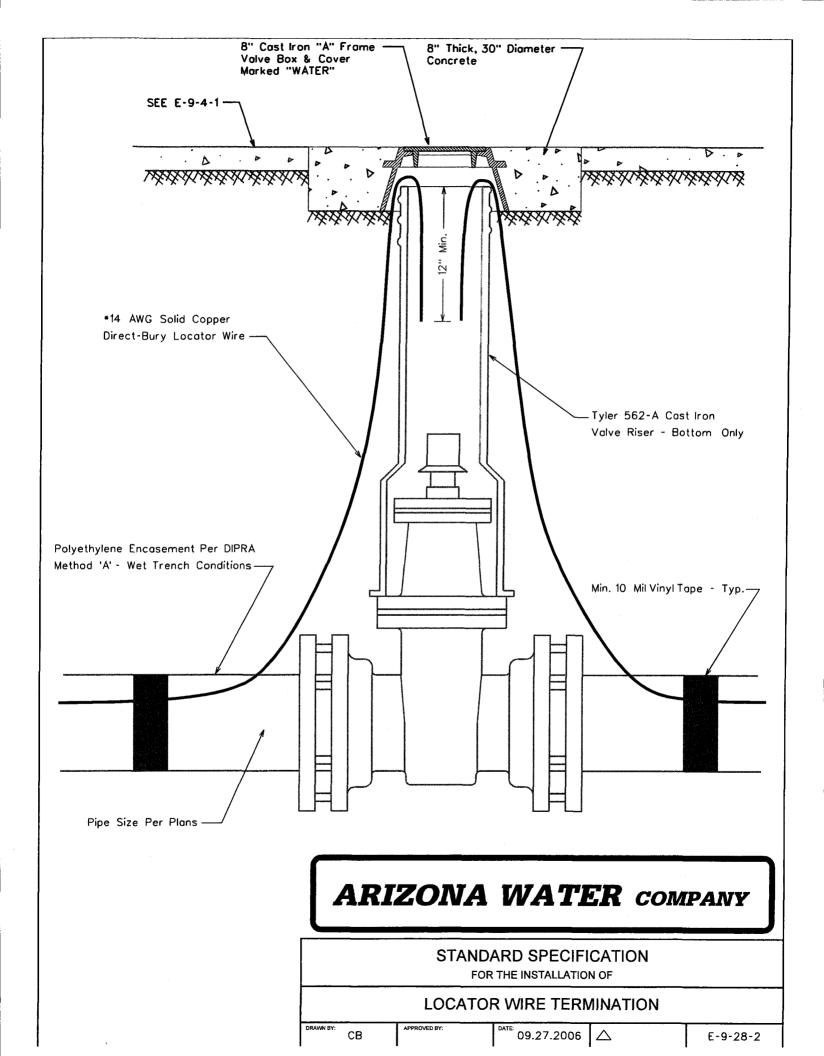
PIPE WARNING TAPE AND LOCATOR WIRE

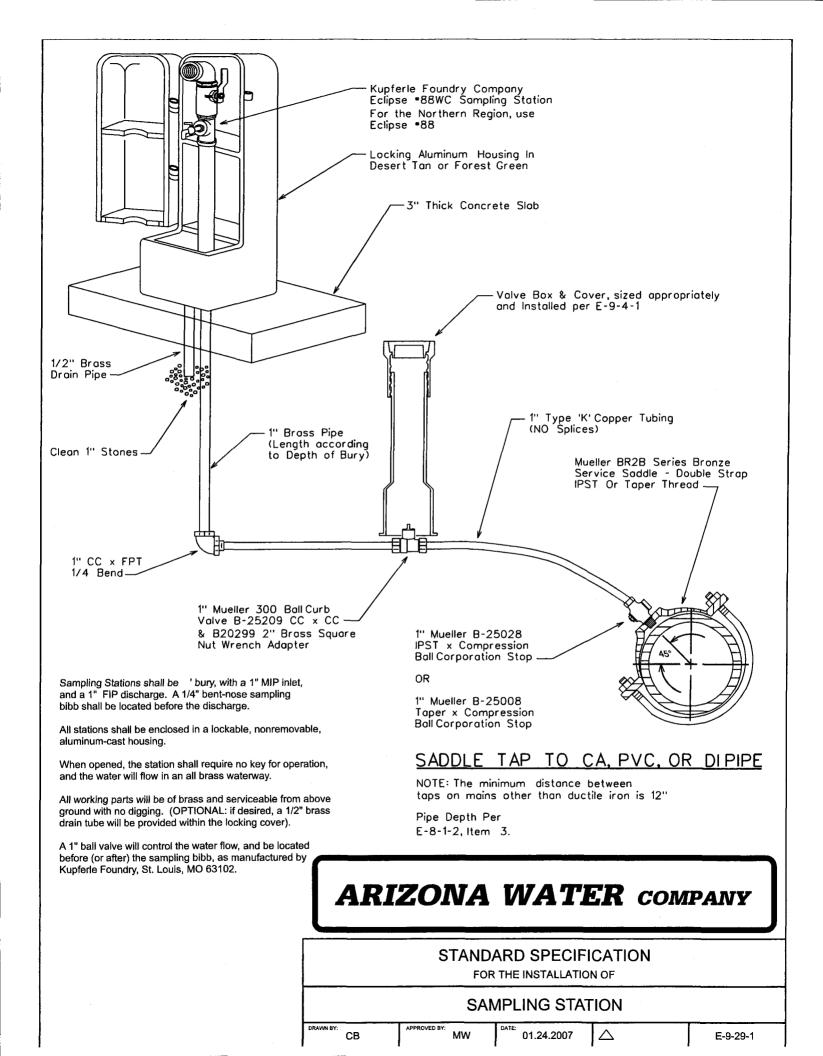
THE TOTAL THE ESOMETIME

CB APPROVED

03.24.1997 🛆 09.27.2006

E-9-28-1







ENGINEERING REVIEW SECTION DATA REQUIRED WITH ECC

INSTRUCTIONS NO THE RESERVE OF THE R

Please complete the test data and submit this form with the Engineers Certificate of Complete the test data and submit this form with the Engineers Certificate of Complete the test data and submit this form with the Engineers Certificate of Complete the test data and submit this form with the Engineers Certificate of Complete the test data and submit this form with the Engineers Certificate of Complete the test data and submit this form with the Engineers Certificate of Complete the test data and submit this form with the Engineers Certificate of Complete the test data and submit this form with the Engineers Certificate of Complete the test data and submit this form with the Engineers Certificate of Complete the test data and submit this form with the Engineers Certificate of Complete the test data and submit this form with the Engineers Certificate of Complete the test data and the Engineers Certificate of Complete the test data and the Engineers Certificate of Complete the test data and the Engineers Certificate of Complete the test data and the test data be issued without the data identified below in accordance with Arizona Administrative (all supplemental information and calculations to this form.

E33-5-508(C). Please attach

DATA

1.

2.

3.

PRESSURE TEST DATA	
Indicate Segment Tested	
Progenite and Leakage Test Results (Pass/Fail)	PASSED
Date Tested	
Time Started	19:00
Time Finished	16:00
Pipe Diameter	12"
Footage Tested	3423
Allowable Leakage	8.22
Leakage Observed	Ð
Pressure at Test Point	200
Employee Observing the Test (Please Print Legibly)	STEVE OFF
Signature of Employee Observing the Test	J. Corr

DISINFECTION SAMPLING Initial Sampling Date 1-20-11 1-20-11 11:00 (Minimum 50 ppm available chlorine) Time 11:00 ppm Cl 200 200 After 24 Hours Detention Time 1-21-11 1-21-11 Date (Minimum 10 ppm free chlorine) Time 12:00 #130 200 200 ppm C1 1-24-11 After Sufficient Flushing 1-24-11 Date (Water is clear and system Cl- residual is measured) Time 8:00 8100 1.5 ppm CI Bacicriological Sampling(s): 1-24-11 Time 9:00 Anached (Y/N) 485 YesNo Yes/No

Certification
CALIDING ALLON

I. STEVE ORTIZ, certify that I have inspected the work performed and have found it to be satisfactory and in accordance with Arizona Administrative Code. Arizona Engineering Bulletins, and the approved specifications.

othorized Persons Signature

41046 JAMES T. WILSON

FUERUARY 3 no. 2009

PAGE LOFT



ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY



1110 West Washington Street • Phoenix, Arizona 85007 (602) 771-2300 • azdeq.gov

APPROVAL OF CONSTRUCTION

Project Description:

Arizona Water Company-Coolidge Airport Watermain Extension. AOC Permit for

the Installation of approximately 3,400 LF of 12-inch DIP Waterline and Related Fittings. To Replace approximately 4,500 LF of existing 6-inch CA Pipe.

Location:

Coolidge, AZ

Project Owner:

Arizona Water Company, c/o Mr. James T. Wilson

Address: P.O. Box 29006, Phoenix, AZ 85038

The Arizona Department of Environmental Quality (ADEQ) hereby issues an Approval of Construction for the above-described facility based on the following provisions of Arizona Administrative Code (A.A.C.) R18-5-507 et seq.

On October 25, 2010, ADEQ issued a Certificate of Approval to Construct for the referenced project.

On February 3, 2011 James T. Wilson, P.E., certified the following:

• A final construction inspection was conducted on February 3, 2011;

The referenced project was constructed according to the as-built plans and specifications and ADEQ4s
 Certificate of Approval to Construct;

■ Water system pressure and leakage tests were conducted on January 19, 2011, and the results were within the allowable leakage rates;

■ The water storage system was disinfected according to an ADEQ-approved method; and

■ The applicant has the right to appeal this AOC Permit. Appeal information is on reverse side of this Permit.

Microbiological samples were collected on January 24, 2011 and analyzed on January 25, 2011 by Legend Technical Services, Inc., ADHS License No. AZ0004. The sample results were negative for total coliform.

This Approval of Construction authorizes the owner to begin operating the above-described facilities as represented in the approved plan on file with the ADEQ. Be advised that A.A.C. R18-5-124 requires the owner of a public water system to maintain and operate all water production, treatment and distribution facilities in accordance with ADEQ Safe Drinking Water Rules.

FMS

PWS No.: 11-014 LTF No.: 53754

Janak K. Desat, P.E., Manager

Drinking Water Facilities Review Unit

Drinking Water Section

c: TEU File No.: 20100203

CRO Approval of Construction File Pinal County Health Department

Pinal County Planning & Zoning Department

AZ Corporation Commission

Engineer

Ms. Karen E. Berry, ADEQ Field Inspector

Ms. Deborah L. Schadewald-Kohler, ADEQ Field Inspector

Northern Regional Office 1801 W. Route 66 • Suite 117 • Flagstaff, AZ 86001

(928) 779-0313

Southern Regional Office 400 West Congress Street • Suite 433 • Tucson, AZ 85701

(520) 628-6733

Printed on recycled paper

UL 1-4768

ARIZONA WATER COMPANY WORK AUTHORIZATION

W.A. NUMBER:

SHEET NO.:

1-4801

P.E. NUMBER: BUDGET ITEM NO.:

1-4801 1 of 2

SYSTEM:

TAX CODE:

CASA GRANDE

0404

PINAL VALLEY

WORK TO START BY: WORK TO BE FINISHED BY: UPON AUTHORIZATION WITHIN 60 DAYS

DESCRIPTION OF WORK:

Pull and replace the pump and motor at Tierra Grande Well #3

FACTORS JUSTIFYING WORK:

The pump has failed and is no longer producing any water. Approved 2011 Budget Item (\$88,000)

COST ESTIMA	TE .	AUTHORIZATION	DATE
COST OF WORK: MATERIAL	0	James Wilson 9w 3/15/11	3/4/11
LABOR	8,500 68,323	PEVIEWED FOR ESMT/POW VERIFICATION:	03-09-2011
CONTRACT PORTION OVERHEAD	11,523	Charles Briggs CB 63-16-2011 REVIEWED BY:	
TOTAL AUTHORIZED EXPENDITURES CHARGEABLE TO THIS W.A.	\$ 88,346	Mike Loggins ML 3-16-11	3-9-//
FUNDS RECEIVED: CONTRIBUTIONS RECEIVED	0	Fremck Schneider	3-8-11
REFUNDABLE ADVANCES RECEIVED TOTAL CONTRIBUTIONS/ADVANCES	0	APPROVED BY FINANCE: Joseph Harris	3/11/11
NET CASH REQUIRED COMMENTS:	\$ 88,346	AUTHORIZED BY PRESIDENT: William Garfield	3-14-20U
		RELEASED CONSTRUCT CONSTRUCT Authorized by FRED, SCHN Date 3/16/20/1	ION
		2011 BUD	GEI

W.A. NUMBER: P.E. NUMBER:

1-4801

BUDGET ITEM NO .: SHEET NO .:

1-4801 2 of 2

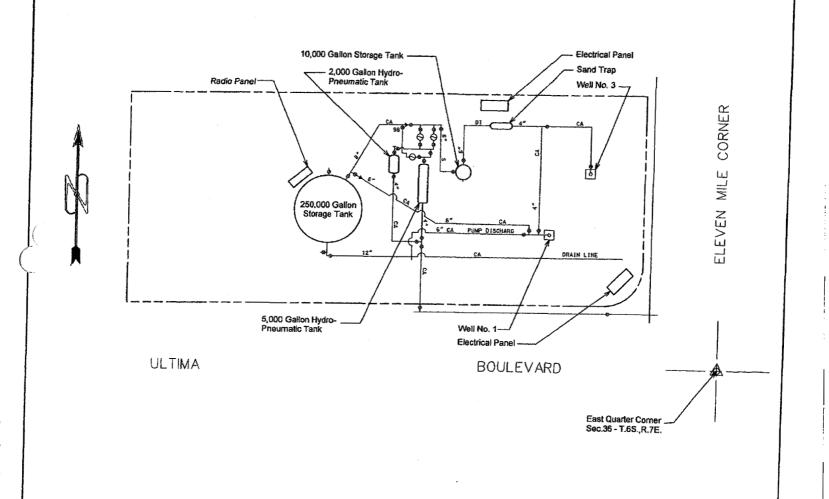
WORK AUTHORIZATION - DETAIL SHEET

	PLANT PROPERTY ACCOUNT	UNIT DESCRIPTION	QUANTITY	YEAR INSTALLED AND W.A. NUMBER
RETIREMENT	325	Goulds 90L10 submersible pump and me	1	1997 1-2186
PROPERTY				
UNITS				
Established Shakkarana Dir.				

Pull and replace the pump and motor at Tierra Grande Well #3

	DESCRIPTION	PLANT PROP ACCT	QUANTITY	UNIT COST		TOTAL
Ì	Provide & Install Goulds 95L10 submersible pump & 10 HP motor	325	1	\$ 4,752.00	\$	4,75
	Provide and install 12AWG 4 wire submersible pump cable	325	330	1.39		459
	Provide and install 3"x21' column pipe	325	12	136.29		1,63
~ .	Provide & install Flowmatic 80DIX check valve w/knock out plugs	325	2	285.10		570
	Provide and install 3/4" PVC sounding line	325	330	0.30		99
Τ	Provide and install 1/4" SS air line	325	330	2.53		835
R	Provide and install all misc. materials	325	1	210.00		210
	Video Weli	325	4	600.00		2,400
Τj	Brush and bail well	325	60	165.00		9,900
w	Install and remove temporary 8" HDPE line	343	1	24,127.10		24,127
•••	Monthly rental fee	343	2	11,668.20		23,336
R						
ĸ	SERVICE CONNECTIONS COMPLETE: DOUBLE-LONG	345				
ı	SERVICE CONNECTIONS COMPLETE: DOUBLE-SHORT	345				
ı	SERVICE CONNECTIONS COMPLETE: SINGLE-LONG	345				
ı	SERVICE CONNECTIONS COMPLETE: SINGLE-SHORT	345				
_	AL CONTRACT WORK				\$	68,323
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<u>ד</u>		1				
E R	SERVICE CONNECTIONS: DOUBLE-LONG	345				-
, 1	SERVICE CONNECTIONS: DOUBLE-SHORT	345				
ΑI	SERVICE CONNECTIONS: SINGLE-LONG	345				
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	METERS	346				
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L		 				
^	TESTING FEE	343	1	500.00		500
В О	PERMIT FEE	343		3,000.00		3,000
P	SURVEY FEE			5,000.00	<u> </u>	5,000
	FIELD INSPECTION	343	1	5,000.00	<u> </u>	3,000
	INSTALL SERVICE CONNECTIONS: DOUBLE-LONG	345			ļ — —	
	INSTALL SERVICE CONNECTIONS: DOUBLE-SHORT	345				
	INSTALL SERVICE CONNECTIONS: SINGLE-LONG	345 345				
	INSTALL SERVICE CONNECTIONS: SINGLE-SHORT	345			 	0 50
_	AL LABOR				\$	8,500
6110	TOTAL - CONTRACT WORK, MATERIALS, AND LABOR				\$	76,82
20E						11,523

AFH



TIERRA GRANDE WELL SITE

NE1/4 SEC.36-T.6S.,R.7E.
WATER DISTRIBUTION
ARIZONA WATER COMPANY
PHOENIX, ARIZONA
SCALE: 1"-30"0" DATE: 6/24/2003

STATIC 2 188 - 191'

PYNAMIC @ 1005pm 2 171'- 198'

PUMP SUTTING 33.0' SY" PUMP/MOTION.

BOTTOM of WITH @ 365'

3"(OLUMN)

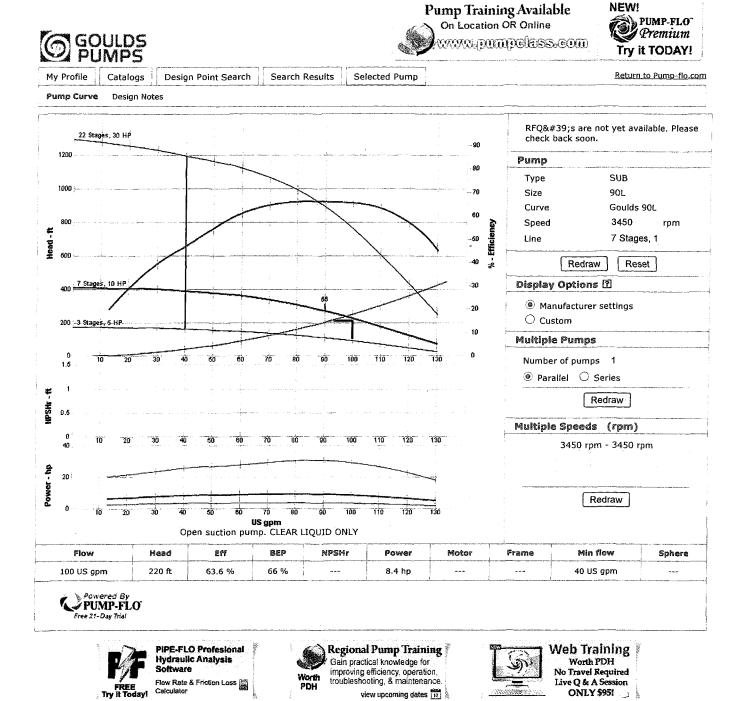
VUROLITY & 1005pm = 4.5 5ps / 2015 = 10' PUMPS INTO 75016 74' MILL THINK TDIA = 74' +10' + 198' + 20' = 757' - 203'

PIX LIGHT

LONGOVERY DUMP TON TO ANTITS

BATER BRAND 95 /4 LINE

7900





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CL/TG GYGTEN MERCONNETT

CL WAREHOUSE 1432 TUPSE CL FIE IN 1442

TO TIE IN 1450

TANGER 177. 1479 = 50 psi cut ann CC

TO YANKSITE 1479 = 50751 FOR FRANCI.

LAPALMA BOOSTER WITH #6 1427 ele.

PUAL DOWN AVE TRY VERMIND THRU APRIL 2 88 5 pm BOOSTON MAY NOT BE NECESSARY # 15 IT IS INSTALL PRUSS PREILE ON SYSTERY.

GIMILAR NUMBER OF CUSTOMIAS ON GONTH LAD OF COOLITIES = 375

TOTAL ADAM 3 180974.

WILL AT PRODUCTION IMS PROPUD FROM 1005, FOR 11 (0) TO Oppur BY 4/10. FUMPWAS 1345 DED AT SHAP TIME. LAST ICOLARUS IN 1997

TIERRA GRANDE WELL #3 – TIERRA GRANDE AZ EQUIPMENT SPECIFICATIONS

Existing Well Information

Location: 50 W. Ultima Boulevard.

Northwest Corner of the intersection of 11 Mile Corner Road and Ultima Blvd.

Drilled by: Do

Don Butts - 1972

Casing:

20" Mild Steel from 0-496' and 16" Mild Steel from 496'-585' with machine cut

perforations from 223'-460', torch cut perforations in 16", 6 cuts every 2'.

Pump:

Goulds 90L10 7-Stage submersible pump.

Motor:

Franklin 10 HP 480V 3 phase, 3500 RPM submersible motor.

Special Conditions

 All scrap materials removed from the well including the pump, motor, column and bailed materials are to be removed and disposed of by the contractor.

Design Conditions

100GPM @ 220' TDH. Pump setting: 330 ft.

Equipment to be Furnished and Installed by Pump Company

- One Goulds 90L10 7-stage 10HP 480V 3 phase, 3500 RPM submersible pump assembly or alternate with Arizona Water Company Engineering approval.
- 330 ft 12AWG 4-wire submersible pump cable
- 330 ft. 3" column pipe.
- Two 3" Flomatic 80DIX check valves with break out plugs.
- 330 ft. 3/4" I.D. SCH 40 solvent weld PVC sounding line.
- 330 ft. 1/4" Baski Stainless Steel air line.
- Video Well (2X).
- Brush and Bail well using cable tool rig.
- All miscellaneous bandits, buckles, tape, etc.
- All material subject to Arizona Water Company Standard Specification OE-11-22 (enclosed) except as noted

Approved Alternate 10-HP Submersible Motor Assemblies

Hitachi.

Pleuger

Franklin

Jacuzzi

CentriPro

Included with Each Bid Should be a List Including:

Maximum Bhp

Operating Bhp

Overall efficiency at design conditions



Submittal Data

L Series Submersible

Submersible Pumps

MODEL: 95L10

Hydraulic Data				Motor Data	L Series 6 Inch Submersible
Maximum Flow	Flow at Duty Point	Maximum TDH	TDH at Duty Point	Voltage / Phase / Enclosure	Model
140 US g.p.m.	100 US g.p.m.	427 ft	220 ft	460V 3 Phase	95L10
Submittal Prepared	for: ., .		Job:		
Engi neer.			Contra	ector:	
Submittal Prepared	by:		Compo	any:	
Submittal Date: 201	1-01-25		Appro	ved by:	Date:

Engineering Data

Pump Code: 95L10 Pump Size: 6 Inch

Pump Max Horsepower: 0.00 hp Pump Shut Off Head: 427 ft Motor Speed: 3600 rpm Max. Temperature:

Liquid: Water Motor Code: 6M104

System input Power: 3~ 460 V Motor Rated Horsepow er: 10.00 hp Max. Frequency 60

Bectrical Enclosures:--Motor Standard: --Suction Flange Standard: Suction Flange Rating: Suction Size: Discharge Flange Standard:

Discharge Flange Rating:

Discharge:

Approximate Net Weight: 35 lb

Impeller Size: "

Impeller Construction: Closed Impeller Type: Radial impeller

Impeller Material:

AISI 304 Stainless Steel Sense of Rotation: Clockwise from the drive end

Shaft Seal:

Standard Equipment / Capability:

Powered for Continuous Operation: All ratings are within the working limits of the motor. Pump can be operated continuously.

New Design Features: Cast 304 SS discharge head and motor adapter. Field Serviceable: Easy to Install and service. All parts easily dismantled if field service is ever necessary.

Diverse Application: Designed for commercial, municipal, and agricultural water needs.

Stainless Steel Construction: Durable In most waters.

Bearings: Replaceable, silicon carbide bearings allow excellent abhasives handling and wear resistance.

Built-in Check Valve: Positive sealing, stainless steel check valve assembly incorporated into discharge head. Impellers: New stainless steel impeller design provides improved efficiency. emicency.

Four-Fluted Shaft Design: Four sided stainless steel shaft eliminates impeller keys and provides positive drive.

Coupling: Removeabla heavy duty stainless steel, splined coupling for maximum load-carrying capability.

Suction Strainer: Stainless steel streiner restricts gravel and other debris from entering the pump. Cable Guard: Stainless steel cable guard surrounds and protects motor leads.

motor reads.
Feateners All fasteners are stainless steel.
NEMA Design Motors: Stainless steel casing resists compain.
Water filled design provides a constant supply of lubrication.
Hemetically sealed stator assures moisture free windings.
Durable Kingsburg type thrust bearing absorbs all thrust. Replaceable motor lead assembly.

8.93 HP AT Design

GOULDS PUMPSPerformance Data

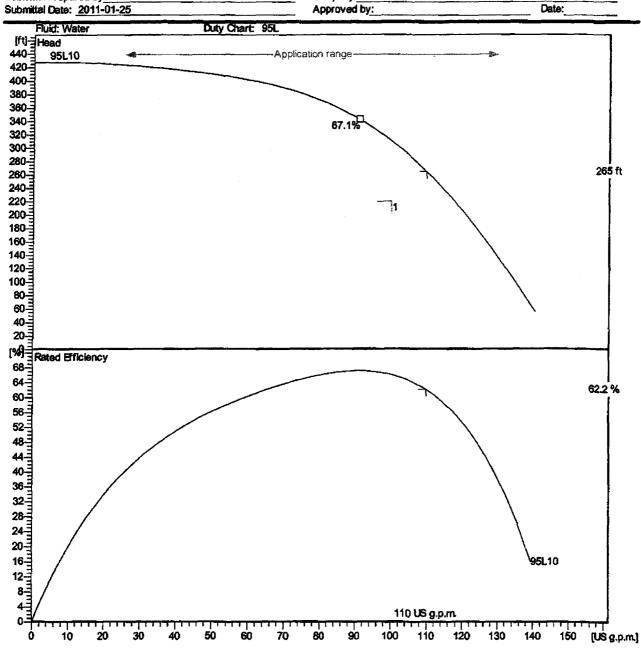
L Series Submersible

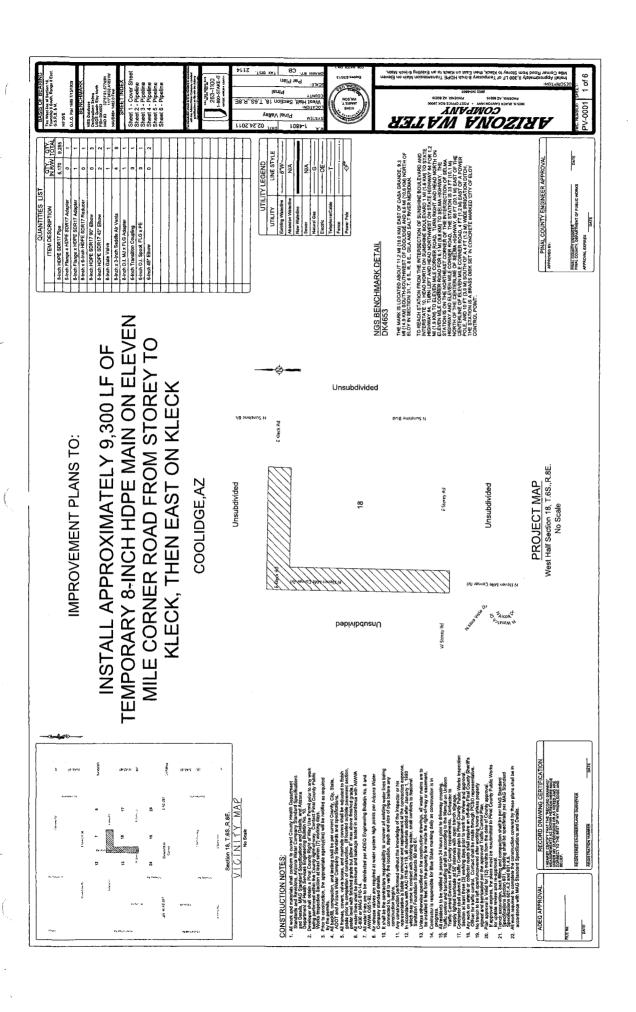
Submersible Pumps

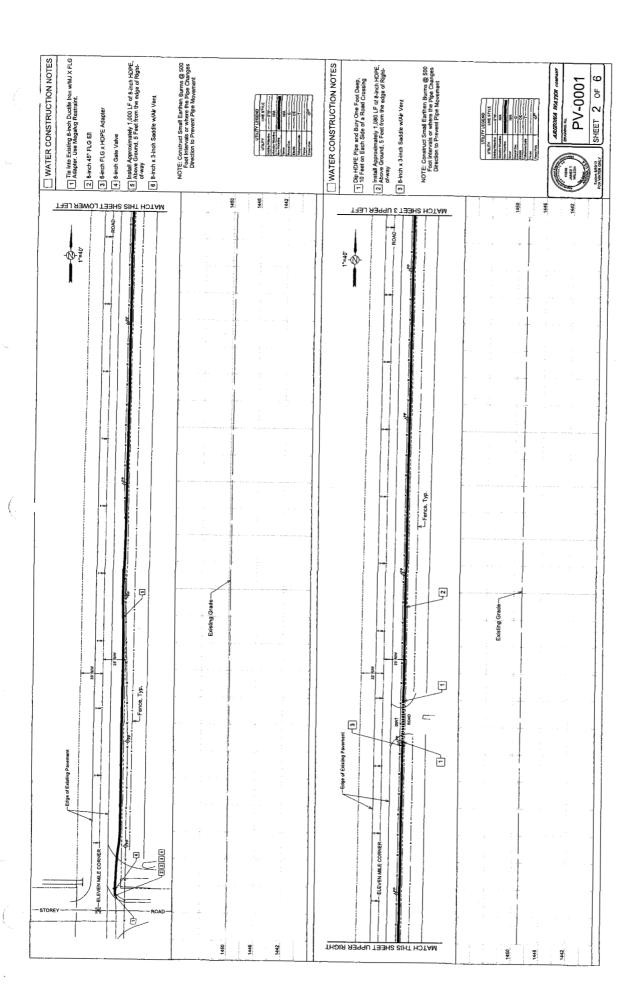
MODEL: 95L10

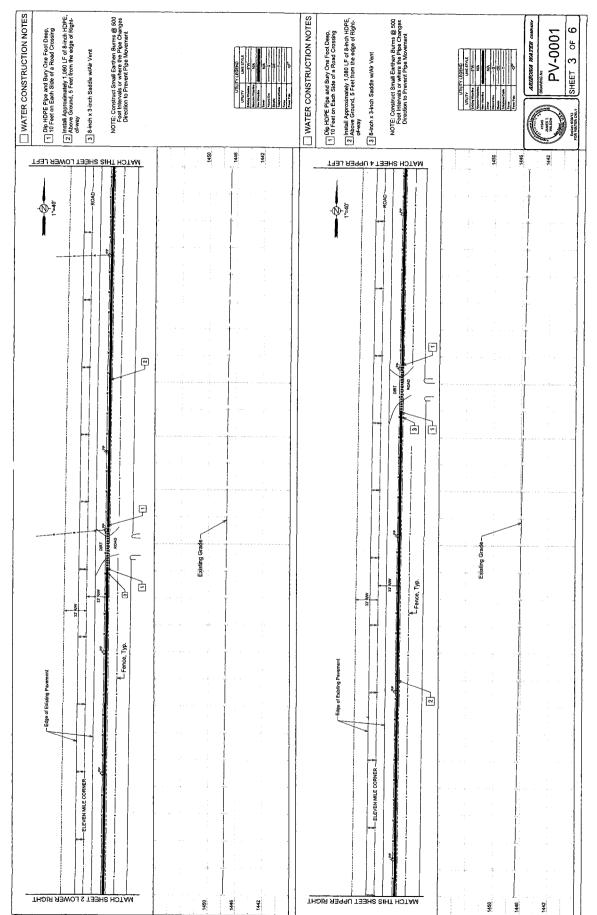
			*		
	Hydrau	ilic Data		Motor Data	L Series 6 Inch Submersible
Maximum Flow	Flow at Duty Point	Maximum TDH	TDH at Duty Point	Voltage / Phase / Enclosure	Model
140 US g.p.m.	100 US g.p.m.	427 ft	220 ft		95L10

Submittal Prepared for: ... Job:
Engineer: Contractor:
Submittal Prepared by: Company:
Submittal Date: 2011-01-25 Approved by: Date:



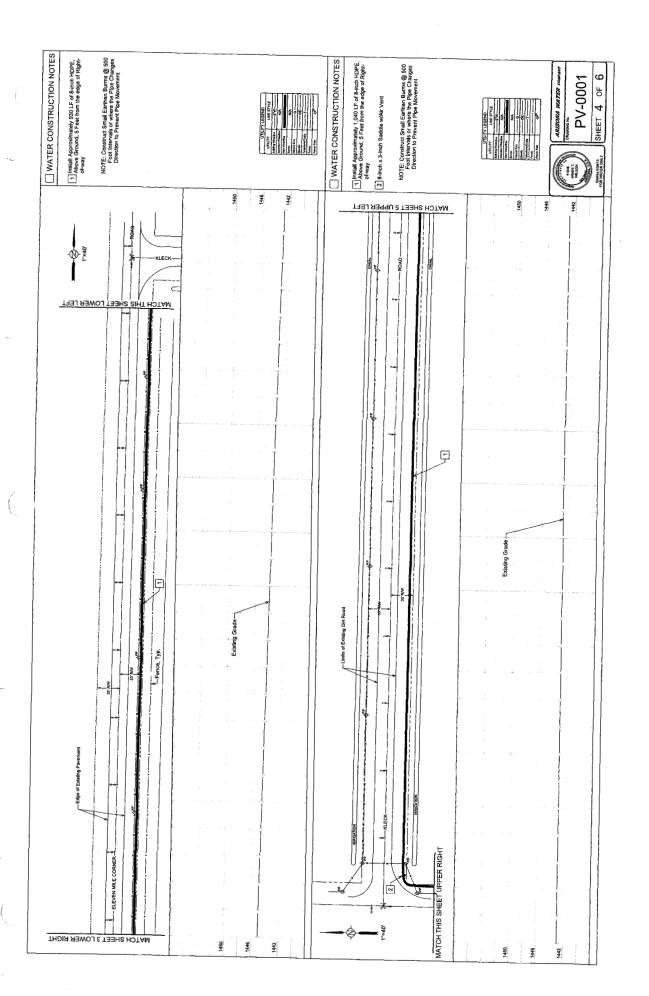


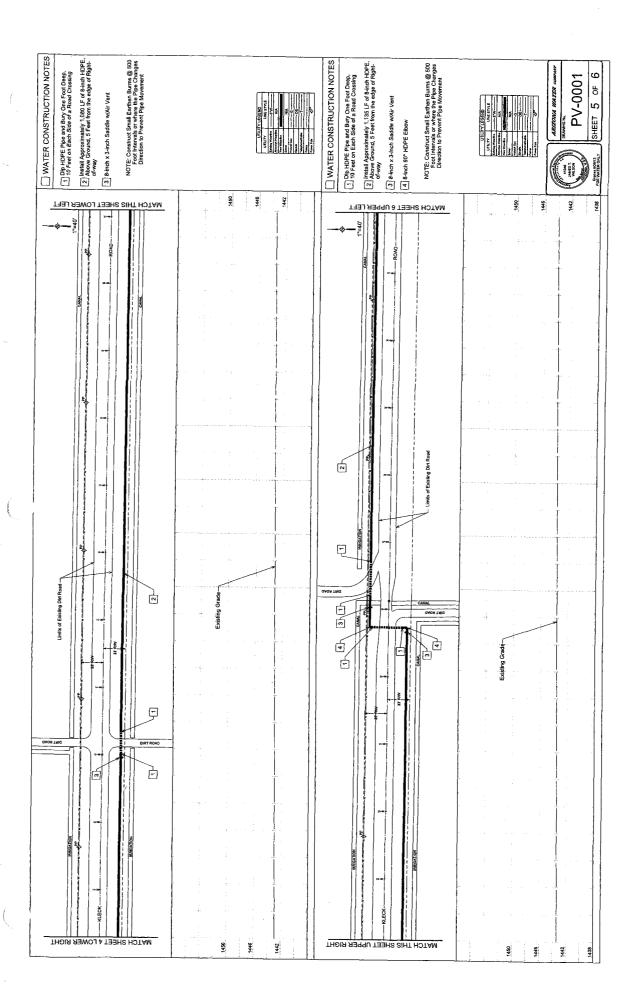




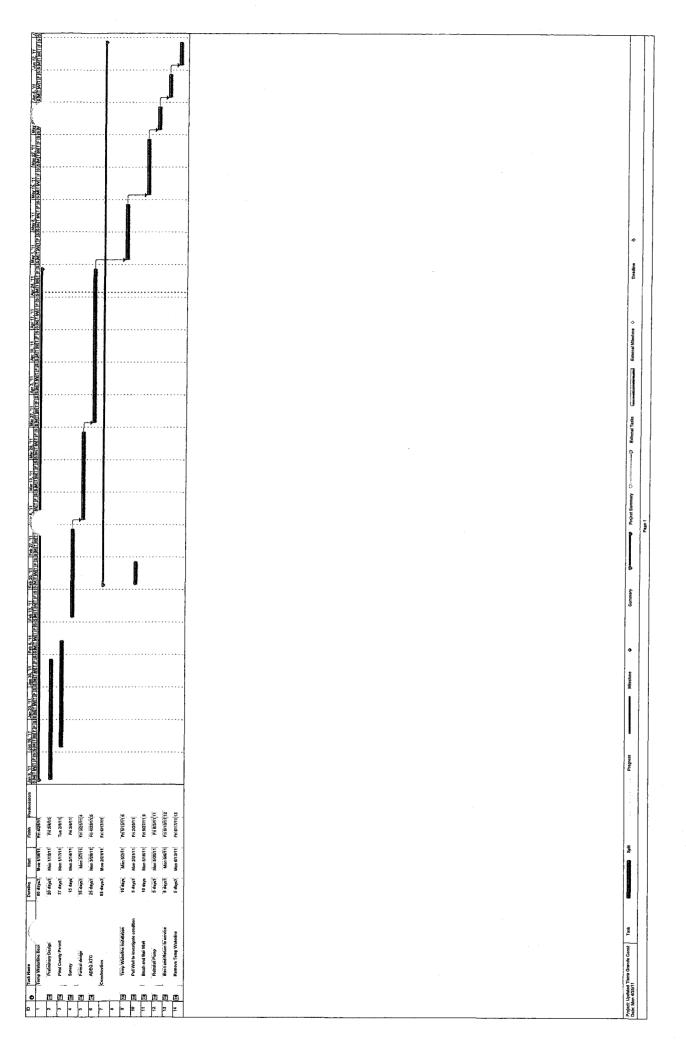
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1.





| Above Ground, 5 Feet from the edge of Right-of-way. She and the Above Ground, 5 Feet from the edge of Right-of-way. 3-inch Saddle w/Air Vent | S. Berich x 3-inch Saddle w/Air Vent | G. Ter Into Existing 6-inch Pipe, 6" Transition | G. Grinch 45" FLG Spoil - FLG x PE. | G. Frinch FLG x HDPE Adapter | S. B. Shroh x 6-Inch HDPE Reducer ☐ WATER CONSTRUCTION NOTES ☐ WATER CONSTRUCTION NOTES ARIZONA WATER COMMY SHEET 6 OF 6 PV-0001 1 Dip HDPE Pipe and Bury One Fool Deep, 1438 1450 1446 1442 456678 <u></u> 2 1446 1442





ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY



1110 West Washington Street • Phoenix, Arizona 85007 (602) 771-2300 • www.azdeq.gov

March 14, 2011

James T. Wilson, P.E. Arizona Water Company 3805 N. Black Canyon Highway Phoenix, AZ 85015-5351

Re: Tierra Grande Temporary Tie-In exemption request, DWFRU #0008-11

Dear Mr. Wilson;

Your letter dated March 7, 2011, proposes to install approximately 9,255 lineal feet of 8 inch HDPE SDR17 pipe and appurtenances to temporarily connect the Tierra Grande water system to the Coolidge water system while Tierra Grande water system wells #1 and #3 are being redeveloped. This temporary line is expected to be in service for a period of 6-8 weeks. The estimated project cost is \$27,746.00.

As this work is not for a subdivision, cost estimate is less than \$50,000.00, and design is sealed by a State registered professional engineer, pursuant to Arizona Administrative Code (A.A.C.) R18-5-505.B.3.b., the proposed construction work is exempt from plan review requirements and exempt from obtaining an "Approval to Construct" from ADEQ, provided the construction is reviewed for conformance with the design by a State registered professional engineer.

After completion of the work, a notice of compliance, which will include the actual project cost, names of the design and review engineers, project completion date, project construction time, and one copy of the as-built engineer plans should be submitted to the undersigned in accordance with the requirements of A.A.C. R18-5-505.B.4. In addition, the proposed project is exempt from obtaining an "Approval of Construction" pursuant to A.A.C. R18-5-507.B.2.

Please call me at 602-771-4672 if you have any questions.

Sincerely

Nancy Lou/Sandoval

Environmental Engineering Specialist

Engineering Keview Section

cc: Pinal County Health Department

Northern Regional Office 1801 W. Route 66 • Suite 117 • Flagstaff, AZ 86001 (928) 779-0313 Southern Regional Office 400 West Congress Street • Suite 433 • Tucson, AZ 85701 (\$20) 628–6733



CITY OF COOLIDGE PUBLIC WORKS DEPARTMENT

355 S 1st ST. COOLIDGE AZ 85128-4418 520-723-4882 FAX: 520-723-3004 coolidgesz.com

PERMIT NO. 11-04-23-RWU

PERMIT TO USE RIGHT-OF-WAY (UTILITY COMPANIES)

A PERMIT IS HEREBY ISSUED to use the right-of-way described herein solely for the Scope of Work set forth below with the expressed understanding that all conditions, general and special, are part of this permit and must be faithfully performed to the satisfaction of the City of Coolidge, hereinafter referred to as "City," and in accordance with plans, specifications and special requirements approved by the City. Work under permit may commence as of the issuance date. This permit must be posted on site at all times. All work shall be completed by the expiration date set forth below.

THIS PERMIT IS FOR WORK IN CITY OF COOLIDGE RIGHT-OF-WAY ONLY. HOWEVER, ISSUANCE OF THIS PERMIT DOES NOT CONFIRM THE EXISTENCE OF CITY RIGHT-OF-WAY. VERIFICATION OF RIGHT OF WAY IS THE PERMITTEE'S RESPONSIBILITY.

IF GRADED OR DISTURBED AREA EQUALS OR EXCEEDS 0.1 AC., YOU MUST APPLY FOR A DUST CONTROL PERMIT FROM PINAL COUNTY AIR QUALITY CONTROL (520-866-6929)

LINEAR FEET: (TRENCHING)	Apprx. 60 Ln Ft	PERMIT FEE:	- 0 - (TO BE COMPLETE BY PUBLIC WORKS)
			(TO BE COMPLETE BY PUBLIC WORKS)
PERMITTEE NAME:	Arizona Water Co.	(Kevin Pakka: Operation	ns Superintendent)
ADDRESS:	220 E 2nd St., Casa	Grande, AZ 85122	
PHONE & FAX:	836-8785 x 19	Fax: 836-2850	
CONTRACTOR NAME & LICENS	E NO: Rain for Rent ROC	# 173380	·
SCOPE OF WORK:	install aprox. 3900 Lr	ft of HDPE temporary tra	nsmission main from 11 Mile
,	Corner Rd along Kled	k Rd & tie into existing ma	ain.
	· · · · · · · · · · · · · · · · · · ·		
LOCATION OF RIGHT-OF-WAY:	SECTION: S-18 TO	WNSHIP: 6S	_ RANGE:8E
ROAD NAME & OTHER INFORM	ATION: Kleck Rd eas	t along Kleck Rd.	
SPECIAL CONDITIONS:	Pipe to be installed p	er AZ Water plans 1-4801	dated 02-24-2011. Pipe shall
have a minimum coverage of 18":			
nave a minimum outclade of to	2011 01 02 01		
DATE ISSUED: Apr 4, 20	11 EXP	IRATION DATE:	July 4, 2011
ADDROVED BY			GINEER/ INSPECTOR
ADDDOVED DV		, 	TITI E

THIS DOCUMENT MUST BE POSTED ON THE CONSTRUCTION SITE IN A CONSPICUOUS PLACE. NO WORK WILL BE ALLOWED TO TAKE PLACE INSIDE THE RIGHT-OF-WAY WITHOUT A VALID PERMIT ON SITE. THE PERMITTEE, CONTRACTOR, PERSON OR FIRM DOING THE WORK MUST GIVE VERBAL OR WRITTEN NOTICE OF THE DATE AND TIME WHEN SCOPE OF WORK WILL BEGIN TO THE INSPECTION SECTION BY CALLING THE PUBLIC WORKS OFFICE AT 520-723-4882 OR BY FAX AT 520-723-3004. SUCH NOTICE MUST BE RECEIVED BY THE INSPECTION SECTION AT LEAST 48 HOURS PRIOR TO THE TIME THE WORK WILL BEGIN. A FINAL NOTICE MUST BE GIVEN AND RECEIVED BY THE INSPECTION SECTION WITHIN 48 HOURS AFTER COMPLETION OF THE SCOPE OF WORK IN THE SAME MANNER AS FOR THE START NOTICE.

VIP# 53444



PERMIT NO:

RUP1103-160

PINAL COUNTY DEPARTMENT OF PUBLIC WORKS

Highways, Flood Control, Fleet Maintenance, Emergency Services
P.O. Box 727 31 N. Pinal Street; Building F, Florence, AZ. 85132 (520) 866-6411 FAX (£2.1) 366-7948

Utility Companies

A PERMIT IS HEREBY ISSUED for the Scope of Work set forth below with the expressed understanding that all conditions, general and special, as set forth herein are part of this permit and must be faithfully performed to the satisfection of Pinal County, herein after referred to as "County," and is accordance with plans, specifications and special equirements approved by the county. Work under permit may commence as of the issuance date. This permit must be post at on site at all times. All work shall be completed by the expiration date set forth below.

IF GRADED OR DISTURBED AREA EQUALS OR EXCEEDS 0.1 AC., YOU MUST APPLY FOR A DUST CONTROL PERMIT FROM AIR QUALITY CONTROL (520-866-6929).

ENGINEERS COS	restimate:	\$0.00				71-200 O 182 G TO 1	Late 1973 - السند الوجود والوجود والمتحدد المتحدد الم
APPLICANT: AR	ZONA WATER C	OMPANY/KEVI	N PAKKA		turk (III), dilak saka dina napar (French dir	# # \$\$\$\$### # \$ ######################	de de la company
ADDRESS: 220	E 2ND ST, CASA	A GRANDE, AZ	85122				
CONTACT PERSO	N: KEVIN PAK	KA		EMAIL:			
CONTACT PHONE	5208368785		CONTA	CT FAX: 520	08362850		
CONTRACTOR NA	ME & LICENSE	NO: RAIN F	OR RENT			1	73330
SCOPE OF WORK			OF 8" TEMPORAR' FIE IN TO EXIST. F				5 1 MILE COPINER RD I RO.
PROJECT#			CUBIC YARDS:		LINEAR	R FEET (tr	enching) 300
LOCATION OF RIG	HT-OF-WAY:	District: 1	Section:	18	Township:	6 S	Range: 8 €
ROAD NAME: STO	REY & 11 MILE	CORNER RD N	ORTH TO 11 MILE	CORNER RD	& KLECK		
OTHER INFORMA	TION:				-		
SPECIAL CONDITI			nain along Kleck ar c control shall be p			place per A	rizone Water Company
DATE ISSUED:	4/4/2011		EXPIRAT	ION DATE:	8/2/20	011	
Lou	e Arroyos		Charles	Williams		(526) 705-8822
iss	UED BY		INSPE	CTOR		INSP	ECTOR PHONE #
INSIDE THE RIGHT-OF THE PERMITTEE, CON WHEN THE SCOPE OF AT 520-966-7943.	COUNTY RIGHT-O T BE POSTED ON -WAY WITHOUT A TRACTOR, PERSO WORK WILL BEGI	F-WAY. THE CONSTRUC VALID PERMIT O IN OR FIRM DOIN N TO THE INSPE	TION SITE IN A CON N SITE. IG THE WORK MUS CTION SECTION SY SECTION AT LEAS	SPICUOUS PLA CALLING THE F CALLING THE F	OR WRITTE PUBLIC WOR	RK WILL BE N NOTICE C RKS OFF CE	ALLOWED TO TAKE PLACE FINE DATE AND TIME AT 520-866-6411 OR BY FAX



Pinal Valley - Case Grande 220 E. 2nd Street, Case Grande, Az 85122 Ph: 520-836-8785 FX; 520-836-2850

PROPOSAL/CONTRACT

CONTRACTOR	COOLIDGE ENGINE & PUMP	SYSTEM:	PINAL VALLEY
ADDRESS:	P. O. BOX 957	WA No(s):	1-4801
CITY ST ZIP:	COOLIDGE, ARIZONA 85128	BID DUE DATE:	January 28, 2011

CONTRACTOR SUBMITS this PROPOSAL/CONTRACT to ARIZONA WATER COMPANY, an Arizona corporation (the "Company"), to perform the work and complete the project described on Page 2 (the "Project"), as an independent prime contractor.

- Contractor certifies that it has a complete copy of, and has read, understands and accepts, the Company's General Conditions of Contract, and the Company's Construction
 Specifications and Standard Specification Drawings, (the "Specifications"), all of which are attached hereto. Contractor has examined the specific plans and related construction
 drawings for the Project (the "Drawings"), copies of which are also attached hereto. The General Conditions of Contract, Specifications and Drawings are incorporated into this
 Proposal/Contract. Contractor affirms that all work and materials to be furnished or purchased for the Project will be in strict conformance with the General Conditions of Contract,
 Specifications and Drawings.
- Contractor represents and warrants that it has satisfied and compiled with the provisions of Section 8, Contractor Understands Work and Working Conditions, of the General Conditions of Contract prior to submitting this Proposal/Contract.
- Contractor represents that this Proposal/Contract is fair and honest in all respects, is submitted in good faith and is not submitted in collusion with any other company, entity or person.
- Contractor acknowledges that one hundred percent (100%) Performance and Payment Bonds are required and must be provided to the Company prior to the commencement of work.
- Prior to the commencement of work, Contractor will submit to the Company a list of all materials to be used in the Project. The materials list will include the manufacturer, part number, price and quantity included in this Proposal/Contract.
- 6. Contractor will furnish all labor, tools, equipment and materials required to complete the Project according to the General Conditions of Contract. Specifications and Drawings. No materials purchased by Contractor to be incorporated into the Project are subject to tax at the time of purchase and Contractor will not charge the Company for any such tax. Contractor will pay the applicable transaction privilege tax (the "Contracting Tax") on the Project after Contractor receives payment of the final Project invoice from the Company. The cost of materials incorporated into the Project which are exampt by Arizona Revised State Statuss ("A.R.S.") from the Contracting Tax, for example, pipes or valves having a diameter of four (4) inches or larger, tockuling equipment, fittings and any other related part that is used in operating the pipes or valves (A.R.S. §42-5061 B.6.), will not be included in the total cost of the labor and materials upon which the Contracting Tax is computed. Contractor retains full liability and obligation to pay the Contracting Tax and will defend and indemnify the Company against any demand or obligation to pay the Contracting Tax.
- 7. Contractor will maintain detailed accounting records of all materials purchased and incorporated into the Project. Such records will include all supporting original vendor involces for all materials purchased. Following completion of the Project, Contractor will submit an itemized accounting to the Company which will include all supporting original vendor involces and satisfactory evidence of payment thereof. The Company will not pay Contractor for materials not actually incorporated into the Project, and the disposition of such materials will remain Contractor's responsibility.
- 8. The Estimated Total Cost of the Project, shown on Page 2. is based on estimated labor and material quantities to be furnished. It includes an estimate of the Contracting Tax and the cost of the required Performance and Payment Bonds. Contractor will not cancel, modify or withdraw this Proposal/Contract during a ninety-day (90) period commancing on the Bid Due Date. The Company may accept this Proposal/Contract by signing and mailing, or otherwise delivering, a copy hereof to Contractor during such ninety-day (90) period. If the Company does not accept this Proposal/Contract during such ninety-day (90) period, Contractor may cancel this Proposal/Contract by giving written notice of cancellation to the Company.
- 9. Prior to the commencement of work, Contractor will provide the Company with a detailed construction schedule, in either Gantt or CPM form, identifying all teeks to be performed from the date of the written Commencement Notice through completion of the Project, including testing, training of Company Personnel and final Project invoicing. Contractor will provide the Company with a copy of such construction schedule documenting that progress of work on the Project at least monthly.
- 10. Contractor will not commence work on the Project until the Company gives Contractor a written Commencement Notice. Contractor will complete the Project within ________calendar days after the Commencement Notice is issued.
- 11. Following the Company's written notice of satisfactory completion of the Project, and upon receipt of the final Project invoice from Contractor, the Company shall pay Contractor the actual total cost of the Project, which will be calculated as shown on Page 2, except that actual tabor and material quantities installed/constructed will be substituted for the estimated labor and materials quantities and the Contracting Tax will be recalculated based on such actual labor and materials quantities.
- 12. The amount of applicable liquidated damages for Contractor's failure to deliver or perform within the time limit shown in Paragraph 10 may be deducted from the Company's payment of the final Project invoice. This provision shall not limit the Company's ability to terminate this Proposal/Contract for Contractor's unsatisfactory performance or failure to perform as provided in the General Conditions of Contract, Specifications or Drawings, or in this Proposal/Contract.

SPECIAL CONDITIONS:

All miscellaneous fittings required to provide a complete pump assembly to be included in the proposal. Contractor to provide complete pumping equipment submittal package for approval prior to start of construction. Design Conditions: Variable flow, constant pressure. 400-1200gpm @ 162 TDH

Date: January 25, 2011	Date: 2-11-2011
Title: Owner	Title: Vice President - Engineering
Print Name: Jack W. Moore	Print Name: Fredrick K. Schneider, PE
By: Milalen	By: Judiua & lunt
COOLIDGE ENGINE & PUMP	ARIZONA WATER COMPANY
CONTRACTOR	PROPOSAL/CONTRACT ACCEPTED:



Pinal Valley - Casa Grande 220 E. 2nd Street, Casa Grande, Az 85;22 Ph: 520-836-8785 FX: 520-836-2850

PROPOSAL/CONTRACT

	TH. 020-000-0100 TX: 050-00						1110101
CONTRACTOR:	COOLIDGE ENGINE & PUMP				SYSTE	u: PINAL V	ALLEY
					W.A. No)(8):	
AZ CONTRACTO	OR LICENSE NO: ROC 188885	CLASSIFICATION:	K-29				801
					BID DU	EDATE:	
ADDRESS:	P. O. BOX 957				J	lanuary 2	8. 2010
					BID BO	ND REQUIRED	
CITY ST ZIP	COOLIDGE, ARIZONA 85128				□ Y	63	√} No
DESCRIPTION OF PROJECT:	Pull and replace the submersible	le pump and mo	tor at Tie	rra Grande	We	ll #3.	
			U	OT PRICE		TOTAL	COST
					_		
1-2. MATERIA	ALS EXEMPT FROM CONTRACTING TAX (per	Paragraph 6) QUANTID	LABOR	MATERIALS	<u> </u>	_LABOR_	MATERIALS
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					(%)—		-
3. Total Labor	to Install Exempt Materials (add the amounts in column	0		i	3		`
	ot Materials (add the amounts in column 2)					***	
	MPT MATERIALS	QUANTITY	LABOR	MATERIALS		LABOR	MATERIALS
Provide and insta	II Goulds 90L10 pump and 10HP submersible moto	r 1	•		W -	1,260.00	3,492.00
	Il 12AWG 4 wire submersible pump cable	330	•	· · · · · · · · · · · · · · · · · · ·	" —	1,200.00	458.70
	i 3"x21' column pipe	16	·	· · · · · · · · · · · · · · · · · · ·	₩-		2,180.64
	ii 3° Flomatic 80DIX check valve with knock out plu				~~	:	570.19
	I 3/4" solvent weld PVC	330		· · · · · · · · · · · · · · · · · · ·		- 3	99.00
Provide and Instal	1 1/4" Baski Stainless Steel air line with gauge and	valve 330			5 —		835.30
Video Well		2		*	***	- (2) - (3)	1,200.00
All miscellaneous	materials (bandits, buckles, tape etc.)	Lot					210.00
Brush and Bail we	ill using cable tool ng (Price/hr.)	1			16	55.00 Hr.	
	o Install Non-Exempt Materials (add the amounts in colu	ımn 5)			7	1,425.00	7
	cempt Materials (add the amounts in column 6)		****** :	t o contracting organic con-		8	9,045.83
	dd lines 3, 7 and 8)					9.	10,470.83
_	Fax Base (multiply the amount on line 9 by 0.65)	********************		4.0	10	6,806.04	
	ontracting Tax Rate				-	7.7%	[
	Tax (multiply the amount on line 10 by line 11)	\$19.649.0235.1420115.14.144.144.144.144.144.144					
-	dd lines 4. 9 and 12)			**************************************			
14. 100% Perion	mance and Payment Bonds Cost						329.85
15. Estimated To	tal Cost (add lines 13 and 14)			tot it core on dischargeomered	*****		11,324.75

NOTE: The Estimated Total Cost includes all labor and materials for backfill, pavement replacement, chip seal, and traffic control necessary for the Project.

CONSTRUCTION SPECIFICATIONS: E-8-1

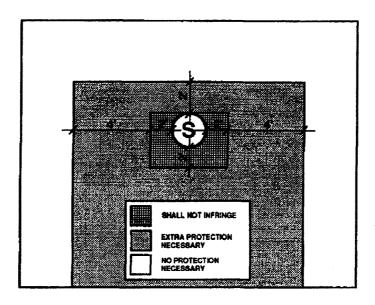
ERRATA 2010

10. PROTECTION OF WATER MAINS NEAR SEWERS

In order to protect water mains from contamination by sewers, the installation of the water mains must conform to the following requirements:

a. Horizontal - When water lines and sewers are laid parallel with each other, the horizontal distance between them shall not be less than six feet (6'). Each line shall be laid on undisturbed or bedded material in a separate trench. Where conditions prevent the minimum horizontal separation set forth above, extra protection will be required. Extra protection shall consist of constructing the sewer main with mechanical joint ductile iron pipe or with slip-joint ductile iron pipe if joint restraint is provided, or encasing both the water main and sewer main in concrete. See Detail E-9-30-1 and E-9-30-2

The Construction Drawings shall indicate the installation requirements. The drawings showing these exceptions shall have been approved by the appropriate state and/or county health department. Refer to the diagram below for clarification.



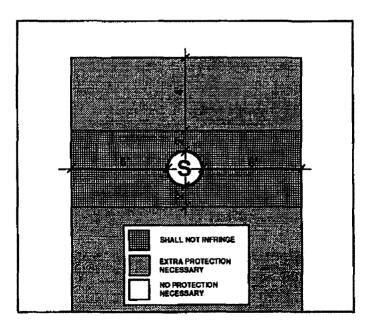
Under no circumstances will the horizontal separation between sewer mains and water mains be less than two feet (2'). All distances are to be measured from the outside of the sewer main to the outside of the water main.

b. Vertical - When a water main is parallel with or crosses a sewer main within two feet (2') above the sewer or greater than two feet (2') below the sewer, extra protection will be required. Extra protection shall consist of constructing the sewer main with mechanical joint ductile iron pipe or with slip-joint ductile iron pipe if joint restraint is provided, or encasing both the water main and sewer main in concrete. See Detail E-9-30-1 and E-9-30-2.

The Construction Drawings shall indicate the installation requirements. The drawings showing these exceptions shall have been approved by the appropriate state and/or county health department.

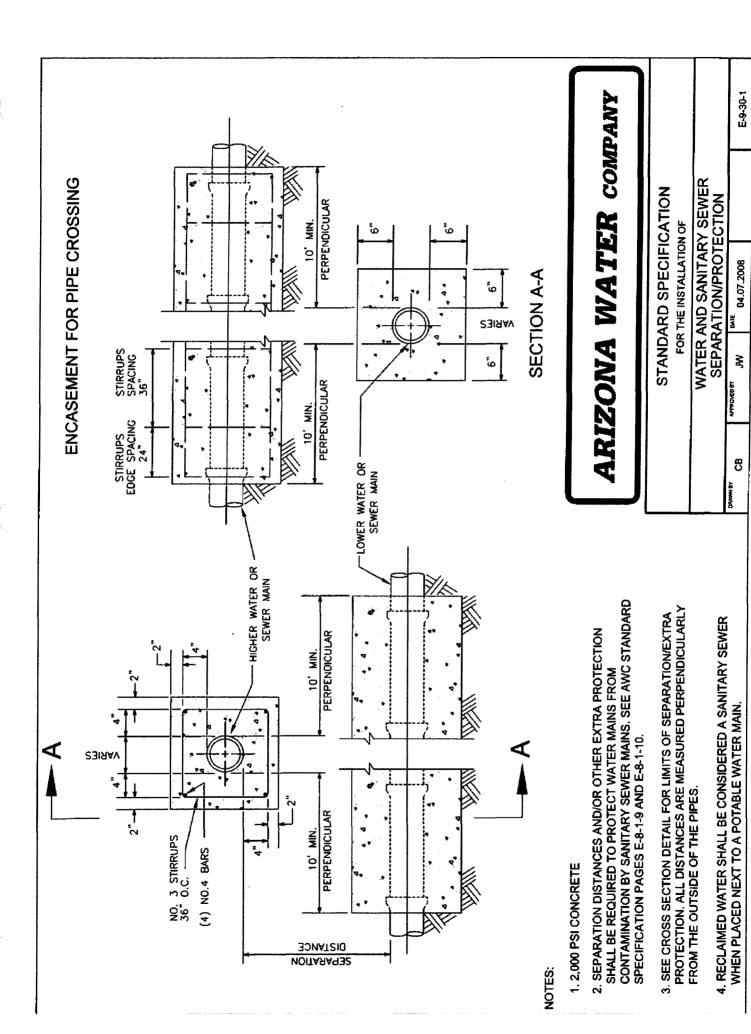
Under no circumstances will the vertical separation of a sewer main installed above a water main be less than two feet (2'). All distances are to be measured from the outside of the sewer main to the outside of the water main. Refer to the diagram above for clarification.

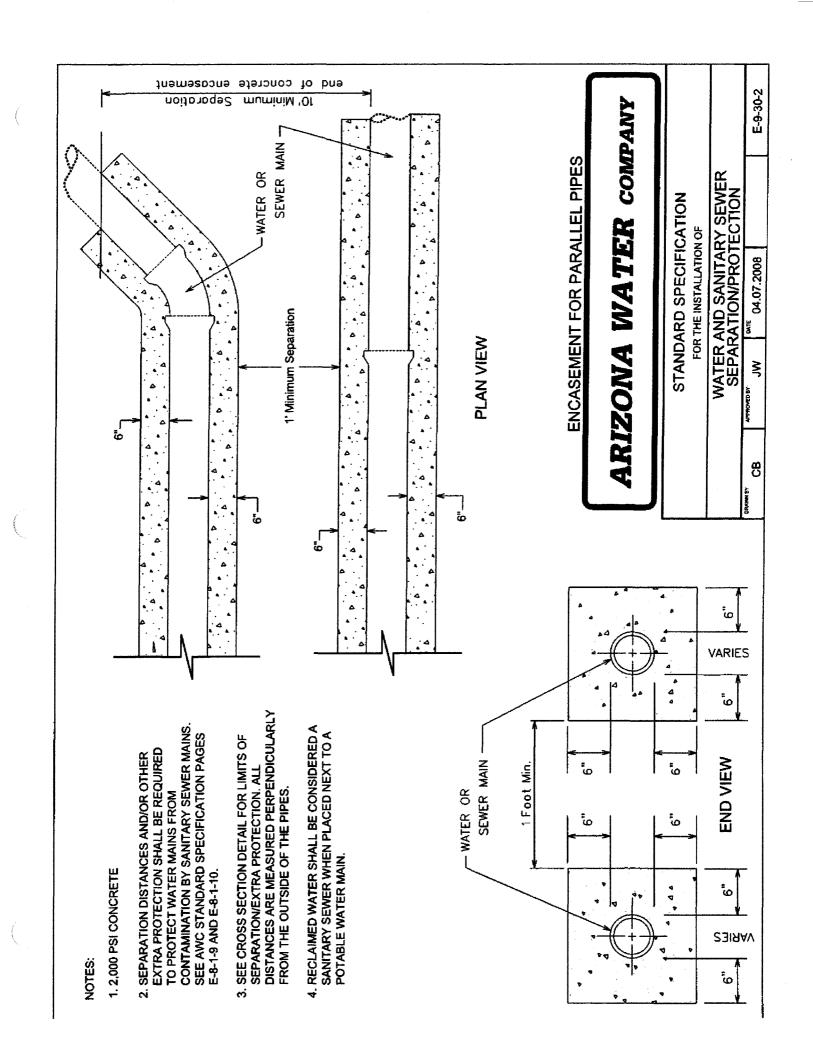
- c. When unusual conditions such as, but not limited to, highway or bridge crossings prevent the water and sewer main separations required from being met, the appropriate state and/or county health department will review and may approve requests for authorization to use alternate construction techniques, materials and joints on a case-by-case basis.
- d. No water pipe shall pass through or come into contact with any part of a sewer manhole. The minimum horizontal separation between water mains and manholes shall be six feet (6'), measured from the center of the manhole.
- e. The minimum separation between force mains or pressure sewers and water mains shall be two feet (2') vertically and six feet (6') horizontally under all conditions. Where a sewer force main crosses above, or less than six feet (6') below, a water line, the sewer main shall be encased in at least six inches (6") of concrete for ten feet (10') on either side of the water main. Refer to the diagram below for clarification.



STANDARD SPECIFICATION DRAWINGS: E-9-1
ERRATA 2010

E-9-20	INSTALLATION OF TYPICAL WELL WITH LINE SHAFT TURBINE PUMP
E-9-21	INSTALLATION OF TYPICAL WELL WITH SUBMERSIBLE TURBINE PUMP
E-9-22	INSTALLATION OF COLUMN PIPE, OIL TUBE AND LINE SHAFT
E-9-23	HOT TAP AND JUMPER METER CONNECTION
E-9-24	INSTALLATION OF TYPICAL WATER LINE ENCASEMENT
E-9-25	INSTALLATION OF CALCIUM HYPOCHLORITE TABLET CHLORINATOR
E-9-26	INSTALLATION OF CHAIN LINK FENCE
E-9-27	INSTALLATION OF SIDE-HUNG WATER LINE SUSPENSION
E-9-28	PIPE WARNING TAPE, LOCATOR WIRE, AND LOCATOR WIRE TERMINATION
E-9-29	INSTALLATION OF A TYPICAL SAMPLING STATION
E-9-30-1	WATER AND SANITARY SEWER SEPARATION/PROTECTION PERPENDICULAR
E-9-30-2	WATER AND SANITARY SEWER SEPARATION/PROTECTION - PARALLEL





3805 N. BLACK CANYON HIGHWAY, PHOENIX, ARIZONA 85015-5351 • P.O. BOX 29006, PHOENIX, ARIZONA 85038-9006 PHONE: (602) 240-6860 • FAX: (602) 240-6878 • WWW.AZWATER.COM

October 19, 2010

Mr. Jim Ryan Clow Valve Company 8121 N. 10th Avenue Phoenix, Arizona 85021

Re: Clow Medallion Fire Hydrants and Resilient Wedge Gate Valves

Dear Mr. Ryan:

Thank you for your interest in working with Arizona Water Company (the "Company") to add Clow Medallion Fire Hydrants and Resilient Wedge Gate Valves to the Company's material and equipment specifications. Based on the Clow product information you provided and your field presentations to our operations and engineering staff, the Company is pleased to inform you that the following items are approved for use in the Company's water systems in Arizona.

Medallion Fire Hydrant:

- Model F-2545
 - 5¼" MVO
 - 4½" pumper
 - 2½" hose
 - Meets AWWA C-502 standard and approval by ULFM

Resilient Wedge Gate Valves:

- Model 2639 & 2640
 - Meets AWWA C-509 Full Body Cast Iron includes 304 SS Nuts, Bolts & Low Zinc Bronze Stem
 - Size range 2½" thru 12"
- Model 2638
 - Meets AWWA C-515 Reduced Wall Ductile Iron includes 304 SS Nuts, Bolts
 & Low Zinc Bronze Stem
 - Size range 14" thru 48"

To: Jim Ryan – Clow Valve Company

October 19, 2010

Subject: Clow Medallion Fire Hydrants and Resilient Wedge Gate Valves

Page 2

We look forward to developing a long-term relationship with you and the Clow products. If I can be of any assistance, please call me.

Very truly yours,

Fredrick K. Schneider

Vice President - Engineering

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VIA EMAIL: JIM.RYAN@CLOWVALVE.COM

3805 N. BLACK CANYON HIGHWAY, PHOENIX, ARIZONA 85015-5351 • P.O. BOX 29006, PHOENIX, ARIZONA 85038-9006
PHONE: (602) 240-6860 • FAX: (602) 240-6878 • WWW.AZWATER.COM

November 24, 2010

Mr. Tony Geiger US Pipe – Waterworks Marketing Consultants 34522 N. Scottsdale Road Scottsdale, Arizona 85226

Re: US Pipe Sentinel Fire Hydrants and Resilient Wedge Gate Valves

Dear Mr. Geiger:

Thank you for your interest in working with Arizona Water Company (the "Company") to add US Pipe Sentinel Fire Hydrants and Resilient Wedge Gate Valves to the Company's material and equipment specifications. Based on the US Pipe product information you provided and your field presentations to our operations and engineering staff, the Company is pleased to inform you that the following items are approved for use in the Company's water systems in Arizona.

Sentinel Fire Hydrant:

- Model Sentinel 250
 - 5¼" MVO
 - 4½" pumper
 - 2½" hose
 - Meets AWWA C-502 standard and approval by ULFM

Resilient Wedge Gate Valves:

- Model US Pipe A-USP0
 - Meets AWWA C-509 Full Body Cast Iron includes 304 SS Nuts, Bolts & Low Zinc Bronze Stem
 - Size range 2" thru 12"
- Model US Pipe A-USP1
 - Meets AWWA C-515 Reduced Wall Ductile Iron includes 304 SS Nuts, Bolts
 & Low Zinc Bronze Stem
 - Size range 14" thru 48"

To:

Tony Geiger - US Pipe

November 24, 2010

Subject:

US Pipe Sentinel Fire Hydrants and Resilient Wedge Gate Valves

Page 2

We look forward to developing a long-term relationship with you and the US Pipe products. If I can be of any assistance, please call me.

Very truly yours,

Fredrick K. Schneider

Vice President - Engineering

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VIA EMAIL: TGEIGER4@COX.NET



SPECIFICATIONS

GENERAL CONDITIONS OF CONTRACT: E-4-1

CONSTRUCTION SPECIFICATIONS: E-8-1

STANDARD SPECIFICATION DRAWINGS: E-9-1

2007 EDITION

GENERAL CONDITIONS OF CONTRACT: E-4-1

F-4-1

GENERAL CONDITIONS OF CONTRACT

DEFINITIONS

- A. <u>Company</u>. The words "Company" or "Arizona Water Company" mean Arizona Water Company, and where applicable, any division of Arizona Water Company, whose principal place of business is located at 3805 North Black Canyon Highway, Phoenix, Arizona 85015-5351 (Post Office Box 29006, Phoenix, Arizona 85038-9006).
- B. <u>Company's Authorized Representative</u>. The words "Company's Authorized Representative" mean any officer of the Company, and any of the Company's Engineers, any Division Manager or Superintendent of the Company and/or such other person(s) designated in writing as the "Company's Authorized Representative" by the President or any Vice President of the Company.
- C. <u>Contractor</u>. The word "Contractor" means either an individual or other entity employed to do the work as shown on the Construction Drawings and as specified herein.
- D. <u>Construction Drawings</u>. The words "Construction Drawings" mean plans prepared by or on behalf of Arizona Water Company.
- E. <u>Invitation to Bid.</u> The term "Invitation to Bid" means the current copy of Arizona Water Company's Form E-3-11-4 Request for Proposal/Contract or Form E-3-12-2 Invitation to Bid.
- F. <u>Contract</u>. The word "Contract" means the written document titled "Contract" or "Proposal/Contract" when such document has been signed by an officer or other authorized representative of both the Contractor and the Company.
- G. <u>Inspector</u>. The word "Inspector" means the Company's Authorized Representative or a person designated in writing by the Company's Authorized Representative.

GENERAL CONDITIONS OF CONTRACT

1. **GENERAL**

These General Conditions of Contract govern all works of installation and construction unless deviations are provided for on the Construction Drawings or in the Contract.

2. BONDS

The Contractor shall, upon request by the Company, furnish a performance bond and a material payment bond in the amount of 100% of the Contract price, in a form and from a surety acceptable to the Company.

3. LABOR AND/OR MATERIAL RELEASES

The Contractor shall supply labor and/or material releases satisfactory to the Company when requested to do so. Forms will be provided by the Company.

4. LICENSE

The Contractor shall have, as may be required by law, a valid license applicable to the work to be performed.

5. INSURANCE

The Contractor shall maintain in full force and effect insurance at no less than the following minimum amounts:

WORKER'S COMPENSATION	In accordance with requirements of the laws of the State of Arizona.
COMPREHENSIVE GENERAL LIABILITY (Including contractual liability covering death, bodily injury and property damage)	Combined single limit of not less than \$1,000,000 for each occurrence.
AUTOMOTIVE LIABILITY (Including owned, non-owned and hired vehicles)	Combined single limit of not less than \$1,000,000 for each occurrence.
SUBCONTRACTOR'S PUBLIC LIABILITY AND PROPERTY DAMAGE INSURANCE AND VEHICLE LIABILITY INSURANCE	Contractor shall either require each of its subcontractors to procure and to maintain Subcontractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance of the type and in the amounts specified in this Section 5 or insure the activities of its subcontractors in Contractor's own policy, in like amounts.

Such insurance shall name the Company, its officers, agents, and employees as additional insured and be primary for all purposes.

The Company will at all times have the right to require that all of such insurance be placed with insurance companies that are satisfactory to it. The Contractor shall file with the Company a certificate evidencing that each policy of insurance for the above coverages in the minimum amounts specified has been purchased and is in good standing.

Such certificate shall provide that notice be given to the Company at least thirty (30) days prior to cancellation or material change in the form of such policies or any of them. Such certificates shall be kept on file by the Company and the Company must have current certificates on file, or a certificate must accompany any bid proposal, before that proposal will be accepted by the Company.

6. CONTRACTOR UNDERSTANDS WORK AND WORKING CONDITIONS

By executing a Contract with the Company, the Contractor warrants that it has, by careful examination, satisfied itself as to the nature and location of the work, including soil conditions, the character, quality and quantity of the materials to be encountered, the character of the equipment and facilities needed preliminary to and during prosecution of the work, the general and local conditions, and all other matters which can in any way be expected to affect its work under the Contract. Verbal agreements or conversations with any officer, agent or employee of the Company, either before or after the execution of the Contract, are not binding upon the Company and shall not affect or modify any of the terms or obligations herein contained.

7. SPECIFICATIONS AND DRAWINGS

The Contractor shall keep on the job a complete copy of all drawings and specifications furnished by the Company which are applicable to the Contract with the Company. Anything mentioned in the specifications and not shown on the drawings or shown on the drawings and not mentioned in the specifications shall be of like effect as if shown or mentioned in both. In case of a discrepancy between the figures, drawings or specifications and physical conditions of the job, the matter shall be immediately submitted to the Company's Authorized Representative for decision as to adjustments, if any, because of the discrepancy; without a decision from the Company's Authorized Representative no discrepancy shall be adjusted by the Contractor, save only at its own risk and expense. Any deviation from the specifications must be approved in writing by the Company's Authorized Representative.

8. PROPERTY PROTECTION

Trees, fences, poles, underground structures and all other property shall be protected unless their removal is authorized on the Construction Drawings. Any property damaged shall be restored by the Contractor, at its expense, to the owner's satisfaction.

SPECIAL PERMITS, LICENSES AND INSURANCE

The Company shall obtain all permits for railroad, county, state, city and irrigation district rights-of-way as well as Forest Service, State Land Department and Bureau of Land Management permits. (Pipeline Contractors)

Whenever blasting is required, the Contractor shall obtain all permits, licenses and insurance required at its expense. (All Contractors)

The Contractor will be required to obtain, and shall certify in writing to the Company that it has obtained, all additional permits required to perform the work including, but not limited to, a National Pollution Discharge Elimination System Permit and/or an Aquifer Protection Permit as those permits relate to disposal of drilling, development and test waters and/or any other discharge or similar activity. (Well Drilling Contractors)

10. SURVEYS

The Company shall be responsible, or arrange, for all surveys required for the work covered in the Contract, unless otherwise specified.

11. BENCH MARKS, PROPERTY STAKES AND SURVEY STAKES

Bench marks, property stakes and survey stakes shall be preserved by the Contractor; in case they are destroyed or removed by Contractor or its employees, the Company will replace them at the Contractor's expense, and the Contractor and its sureties shall be liable therefore.

12. TOOLS, EQUIPMENT AND MATERIALS

The Contractor shall furnish all of the necessary tools, equipment, and pipeline materials required for the work. All material furnished by the Contractor shall be of the quality specified by the Company in its Construction Specifications (E-8-1).

13. SUPERINTENDENCE BY CONTRACTOR

The Contractor shall assure adequate superintendence of the work by a competent foreman or superintendent (with full authority to act on behalf of Contractor) satisfactory to the Company, who will be on the job at all times when work is in progress.

14. ORDER AND DISCIPLINE

The Contractor shall at all times enforce strict discipline and good order among its employees.

15. INDEPENDENT CONTRACTOR

The Contractor is an independent contractor and any provisions in the Contract, the specifications, or these General Conditions of Contract and Arizona Water Company's Construction Specifications which may appear to give the Company the right to direct the Contractor as to the details of the doing of any work to be performed by the Contractor, or to exercise a measure of control over said work, shall be deemed to mean and shall

mean, that the Contractor shall follow the desires of the Company in the results of the work only and not in the means whereby said work is to be accomplished, and the Contractor shall use its own discretion and shall have complete and authoritative control over the work and as to the details of the doing of the work.

16. PUBLIC SAFETY AND CONVENIENCE

Contractor shall at all times conduct its work so as to ensure the least possible obstruction to traffic and other inconvenience to the general public and the residents and businesses in the vicinity of the work, and to ensure the protection of persons and property.

To protect persons from injury and to avoid property damage, Contractor shall provide and maintain adequate barricades as required during the progress of the work and until it is safe to use the property for its intended purpose. The rules and regulations of the local governmental agencies and specific permit requirements respecting safety provisions shall be observed at all times.

In the case of blasting, the Contractor shall exercise extreme caution to protect the general public and personal and public property from harm or damage.

17. PROPERTY PROTECTION

Trees, fences, poles, and all other property shall be protected unless their removal is authorized by the Company. Any property damaged shall be restored by Contractor, at his expense, to Company's satisfaction.

18. RESPONSIBILITY OF CONTRACTOR

The work shall be under Contractor's responsible care and charge. Contractor shall bear all loss and damage whatsoever and from whatsoever cause, except that caused solely by the act of Company, which may occur on or to the work during the fulfillment of the Contract. If any loss or damage occurs, Contractor shall immediately make good any such loss or damage, and in the event of Contractor refusing or neglecting to do so, Company may, or by the employment of some other person, make good any such loss or damage, and the cost and expense of so doing shall be charged to Contractor.

The mention of any specific responsibility or liability imposed upon Contractor shall not be construed as a limitation or restriction of any general liability or duty imposed upon Contractor by the Contract. The reference to any specific duty or liability being made herein is merely for the purpose of explanation.

Contractor alone shall at all times be responsible for the safety of Contractor, Contractor's employees, and its subcontractors' employees, and for Contractor and its subcontractors' plant and equipment and the method of performing the work.

19. ERRORS AND OMISSIONS

If Contractor, in the course of the work, becomes aware of any errors or omissions in the Contract Documents or in the instructions, or if Contractor becomes aware of any discrepancy between the Contract Documents and the physical conditions of the site of

the work, Contractor shall immediately inform Company in writing. Any work done by Contractor after such discovery, until authorized by Company, will be done at Contractor's risk.

20. LAWS, REGULATIONS

Contractor shall give all notices required by law and comply with all laws, ordinances, rules and regulations, including, but not limited to, all applicable federal, state, local and other legally required health and safety standards, orders, rules, regulations or other laws, pertaining to the conduct of the work. Contractor shall be liable for, and shall defend and indemnify Company against and hold it harmless from, all violations of any law, ordinance, rule, regulation, standard, or order in connection with work furnished by or on behalf of Contractor. If Contractor observes that the Contract Documents are at variance with any law, ordinance, rule, regulation, standard, or order it shall promptly notify Company in writing and any necessary changes shall be adjusted as provided in the Contract for changes in the work. Contractor shall not perform any work contrary to such laws ordinances, rules, regulations, standards, or orders.

21. PERMITS, FEES AND INSPECTIONS

Permits and licenses necessary for the prosecution of the work, including, but not limited to, any National Pollution Discharge Elimination Systems (NPDES) Permits required by U.S. Environmental Protection Agency or the Arizona Department of Environmental Quality shall be secured, paid for, and complied with by Contractor.

Contractor shall be responsible for its actions and shall abide by all conditions and/or restrictions set forth in the NPDES Permit and any other permit or license required for this project.

Company shall at all times have access to the work whenever it is in preparation or in progress and Contractor shall provide proper facilities for such access and for all inspections. If the Contract Documents, the General Superintendent's instructions, laws, ordinances or any public authority require any work to be inspected or approved, Contractor shall give timely notice of its readiness for inspection.

Inspection of the work shall not relieve Contractor of any of its obligations even if defective work or unsuitable materials may have been previously overlooked by Company and accepted or estimated for payment. If any work is found not in accordance with the Contract Documents, Contractor, at its sole cost and expense, shall promptly make good such defective work.

22. CONSTRUCTION MARKING (PIPELINE ONLY)

Each job shall be marked and/or barricaded by the Contractor in such a manner that the construction is clearly visible at all times.

23. EXTRA WORK AND/OR MATERIALS

Except as otherwise herein provided, no charge for any extra work and/or material will be allowed unless the same has been ordered in writing by the Company's Authorized Representative, and the price stated in such order.

24. CHANGES

The Company shall have the right to make any changes in the work that it may determine to be necessary. If such changes affect the cost of the work, an equitable adjustment shall be negotiated. Changes shall in no way affect or void the obligations of both parties under the original Contract.

25. INSPECTION

All work and material shall be open at all times to inspection and acceptance or rejection by the Company's Inspector. Any work covered up by the Contractor prior to inspection and acceptance by the Company shall be subject to being uncovered at the expense of the Contractor for inspection by the Company. The Contractor shall give the Company reasonable notice of starting new work and shall provide, without extra charge, reasonable and necessary facilities for inspection, even to the extent of taking out portions of finished work. In case any such finished work removed is found satisfactory, however, the actual direct cost of such removal and replacement, plus 15% of such cost, will be paid by the Company; in addition, if completion of the work has been delayed thereby, the Contractor shall be granted a suitable extension of time on account of the additional work involved.

26. DEFECTIVE WORK OR MATERIAL

The Contractor shall remove, at its own expense, any work or material found defective by the Company's Inspector and shall rebuild and replace the same without extra charge; in default thereof, the same may be done by the Company at the Contractor's expense.

27. ASSIGNMENT

Neither party to the Contract may assign the Contract or sublet it in whole or in part without the written consent of the other, nor shall the Contractor assign any monies due or which may become due hereunder without the previous written consent of the Company, nor shall such consent release the Contractor from any of its obligations and liabilities under the Contract.

28. RIGHTS OF VARIOUS INTERESTS

Whenever work that is being done for the Company other than by the Contractor is contiguous to work being done by the Contractor, the respective rights of the various interests involved shall be established by the Company to secure the completion of the various portions of the work in general harmony.

29. SUSPENSION OF WORK

The Company's Authorized Representative may at any time and for any reason suspend all or any portion of the work under the Contract. This right to suspend work shall not be construed as denying the Contractor compensation for actual, reasonable and necessary expenses due to suspension to which it may be entitled.

The Company's Authorized Representative may order the Contractor to suspend any work because of certain conditions, such as inclement weather, or because the

Contractor is in violation of these General Conditions of Contract or the Construction Specifications. It is understood that compensation for expenses will not be allowed for such suspension when ordered by the Company's Authorized Representative on account of such conditions.

30. PROCEDURE OF WORK (PIPELINE ONLY)

All work under the Contract shall be planned and performed so as to cause a minimum of interference with normal vehicular and pedestrian traffic. At no time shall the Contractor completely obstruct the traffic to any business establishment during normal work hours of that business. It shall be the Contractor's responsibility to maintain facilities for ingress and egress to any business establishment. When crossing any street, not more than one-half of the street may be blocked at one time. All federal, state, county and city laws, rules and regulations relating to this subject are to be obeyed.

The Contractor shall complete any portion or portions of the work in such order of time as the Company may require. The Company shall have the right to take possession of and use any completed or partially completed portions of the work. If such prior possession or use increases the cost of or delays the work, the Contractor will be entitled to extra compensation or extension of time or both, as the Company may determine.

31. DISPUTES

All questions or controversies which arise between the Contractor and the Company, under, or in reference to, the Contract, shall be decided by the Company's Authorized Representative and a representative of the Contractor, and their decision shall be final and conclusive upon both parties.

32. CONNECTION TO EXISTING SYSTEM (PIPELINE ONLY)

Unless approved in writing by the Company's Authorized Representative, no tie-in or hot tap on the existing system shall be made unless the Company's Inspector is present. When the tie-in requires the operation of an existing valve or other control equipment, the conditions of Paragraph(s) 30 and 33 shall be complied with. The Contractor shall notify the Company twenty-four (24) hours prior to tie-in as to the exact time the Contractor plans to make tie-in so that the Company's Inspector will have sufficient time to locate valves and make necessary preliminary arrangements for shut down.

33. PLANNED INTERRUPTION OF WATER SERVICE (PIPELINE ONLY)

No valve or other control on an existing Company water system shall be operated for any purpose by the Contractor without approval of the Company's Inspector. All of the Company's water customers whose service is interrupted by a planned interruption, other than in cases of emergency, shall be notified by the Contractor at least twenty-four (24) hours before the planned interruption and advised of the probable time when the service will be restored.

34. EXISTING UTILITY FACILITIES (PIPELINE ONLY)

The Contractor shall notify all known utilities in the area of the work to be performed under the Contract and shall make arrangements to have their facilities marked in

accordance with A.R.S. ?40-360.022 ("Blue Stake Law"). The Contractor shall be responsible for locating and preserving all marked facilities. Any damages to these marked facilities shall be repaired at the expense of the Contractor.

The Company will pay the cost to relocate its or other structures when such structures are found occupying the physical space of the proposed installation. It is understood that the Contractor will be reimbursed for such work only when written authorization from the Company has been obtained in advance of such work.

35. CLEANING UP

The Contractor shall remove from the Company's property and from all public and private property, at its own expense, all temporary structures, rubbish and waste materials resulting from its operations. In the event Contractor fails to do so, the Company may remove same at the expense of the Contractor.

36. WORKING HOURS (PIPELINE ONLY)

Unless stated to the contrary in the Invitation to Bid and/or so stated on the Construction Drawings, or agreed to by the Company during a Pre-Construction Conference, the Contractor shall not be permitted to perform work on Saturdays, Sundays, or Company holidays, or commence work such as tie-ins that cannot be completed during normal working hours.

37. INDEMNITY

- The Contractor shall indemnify the Company against, and save and hold it harmless from, any and all liability, claims, demands, loss, actions, causes of action, expense, penalties, fines, assessments, damages and costs of every kind and nature for injury to or death of any and all persons, including, without limitation, employees or representatives of the Company or of the Contractor or of any subcontractor, or any other person or persons, and for damage, destruction or loss, consequential or otherwise, to or of any and all property, real or personal, including, without limitation, property of the Company or of the Contractor or of any subcontractor, or of any other person or persons. and the violation of any law, ordinance, rule, regulation, standard, or order resulting from or in any manner arising out of or in connection with the performance of the work under the Contract, howsoever same may be caused, including, without limitation, the Company's active or passive negligence. The Contractor shall also, upon request by the Company, and at no expense to the Company, defend the Company in any and all suits, concerning such injury to or death of any and all persons, and concerning such damage. destruction or loss, consequential or otherwise, to or of any and all property, real or personal, including, without limitation, suits by employees or representatives of the Company or of the Contractor or of any subcontractor, or any other person or persons, or concerning any court or administrative proceeding concerning the violation of any law. ordinance, rule, regulation, standard, or order. Excluded from this paragraph are only those injuries to or deaths of persons and damage, destruction or loss, to or of property arising from the sole negligence or willful misconduct of the Company.
- B. Contractor shall indemnify the Company against, and save and hold it harmless from, any and all liability, claims, demands, damages, costs, expenses and attorney's fees, suffered or incurred on account of any breach of any obligation, covenant or other

provision of this contract, including without limitation, breach of the indemnity provisions of subsection A of this Section 37.

C. Contractor further agrees to defend, indemnify and hold harmless the Company, its directors, officers, employees, and agents, from and against any and all costs, damages, claims, expenses, violations, notices of violations, penalties, liens, assessments, and liabilities of every kind and nature, foreseeable or unforeseeable, directly or indirectly, arising from any release, removal, generation, use, storage or disposal on, under, around, or from the well site of any material, substance, or waste, hazardous or non-hazardous, including, without limitation, drilling fluids, mud, cuttings and development and test water howsoever same may be caused, including, without limitation, the Company's active or passive negligence.

38. <u>LIENS</u>

If at any time there shall be evidence of any lien or claim for which the Company might become liable and which is chargeable to the Contractor, the Company shall have the right to retain out of any payment then due or thereafter to become due, an amount sufficient to completely indemnify the Company against such lien or claim. If the Company determines that such lien or claim is valid, the Company may pay and discharge the same, and deduct the amount so paid from any monies which may be or become due and payable to the Contractor.

39. PAYMENT

Upon completion of the installation or construction, the Company will, within thirty (30) days after receipt of proper invoice and labor and material releases, pay the amount due the Contractor. If the Company believes that additional work, such as clean up, is required, it may deduct the total cost of such additional work from the amount to be paid to Contractor.

40. COMPANY'S RIGHT TO TERMINATE CONTRACT: DAMAGES DUE TO DELAY

If the Company finds the Contractor to be in material violation of any section of these General Conditions of Contract, Construction Specifications or Standard Specification Drawings or if the Contractor refuses or fails to prosecute the work, or any separable part thereof, with such diligence as will insure its completion within the time specified or any extension thereof, or fails to complete said work within such time, or when any other cause exists to justify such action, the Company may, without prejudice to any other right or remedy, by written notice to the Contractor, terminate its right to proceed with the work or such part of the work as to which there has been such violation, delay or other cause.

In the event the Contractor's right to proceed is terminated, the Company may take over the work and take possession of, and utilize in completing the work, such materials as may be on the site of the work and necessary therefore and prosecute said work to completion by whatever method it may deem expedient. The Contractor and its sureties shall be liable to the Company for any excess cost caused thereby.

In the event the Contractor's right to proceed with the work is terminated, the Contractor shall not be entitled to receive any further payment until the work is completed or the job is canceled. If the unpaid balance of the Contract price exceeds the expense of finishing

the work, including compensation for additional managerial and administrative services, such excess shall be paid to the Contractor. If such expenses exceed such unpaid balance, the Contractor shall pay the difference to the Company.

41. GUARANTEE

The Contractor shall guarantee all deslabor and workmanship and any materials it installs for a period of one year following the date of completion and acceptance by the Company. If any portion of the work or any of the materials become defective within the guarantee period, the Company will notify the Contractor of such defect. The Contractor must repair any defect within fifteen (15) days of such notification. If repairs are not completed within this time period, the Company may repair the defect, or cause such defect to be repaired, and the cost of such repairs shall be paid by the Contractor. The Company reserves the right to determine which defects are the result of poor labor and workmanship and which are caused by defective materials.

42. <u>LIQUIDATED DAMAGES FOR NON PERFORMANCE: REQUEST FOR EXTENSION(S) OF TIME</u>

Time is of the essence in the Contract. The time period required for completion of the work will be specified in the Contract. The Contractor agrees that the Company will suffer substantial damages in the event the Contractor fails to complete the work within the agreed upon time period. The Contractor and the Company agree that since it would be impracticable or extremely difficult to precisely fix such damages, a reasonable approximation of such actual damages suffered by the Company shall be a sum equal to 0.5% of the Contract price for each working day beyond the time period for completion of the work specified in the Contract.

Request by the Contractor for extensions of the time period shall be in writing and shall not become effective until approved in writing by the Company's Authorized Representative.

43. PAYMENT FOR REQUIRED TESTING

Whenever testing is required by any governmental agency or by the Company to assure conformance of the Contractor's work with the appropriate standard, it will be paid for as follows:

- a. For testing required under permits obtained by the Company or testing specifically requested by the Company, the cost of the first test will be paid for by the Company. In the event of failure of the first test, the cost of all further testing associated with the failure will be paid by the Contractor.
- b. For testing required under permits obtained by the Contractor, all costs will be paid by the Contractor. Testing of the pipeline for pressure and leakage will be included in the Contract price.

44. CONTRACT DEADLINES AND BONDS REQUIREMENTS

The time limits to be allowed for the completion of any work covered in the Contract shall be established as follows: In the proposal submitted to the Company, in response to the Invitation to Bid, the Contractor shall state the number of calendar days required for completion of the work. The time required will become a part of the Contract. When the Company is ready to proceed with the work, a Commencement Notice will be issued by the Company to the Contractor by mail. The Commencement Notice will allow the time required in the Contract plus ten (10) calendar days and will indicate the final day of the time allowed. The work cannot begin until the Company has received a performance bond and materials payment bond for the Contract price unless the bonds have been waived under the special conditions section of the Contract. The additional ten (10) days is the allowance for time to deliver the Commencement Notice to the Contractor and for the Contractor to return the performance bond and materials payment bond to the Company. Time extensions will be granted if warranted, and only at the time of the delay, thus extending the final day of the time allowed.

If the Company elects not to require a performance bond and a material payment bond for the work, the cost of the bonds will be deducted from the proposed total cost and the Contract will reflect this reduced cost and the bonds requirements will be waived under special conditions of the Contract.

ARIZONA WATER COMPANY

CONSTRUCTION SPECIFICATIONS: E-8-1

ARIZONA WATER COMPANY

E-8-

CONSTRUCTION SPECIFICATIONS FOR THE INSTALLATION OF WATER DISTRIBUTION SYSTEMS DUCTILE IRON

DEFINITIONS

- A. <u>Company</u>. The words "Company" or "Arizona Water Company" mean Arizona Water Company, and where applicable, any division of Arizona Water Company, whose principal place of business is located at 3805 North Black Canyon Highway, Phoenix, Arizona 85015-5351 (Post Office Box 29006, Phoenix, Arizona 85038-9006).
- B. <u>Company's Authorized Representative</u>. The words "Company's Authorized Representative" mean any officer of the Company, and any of the Company's Engineers, any Division Manager or Superintendent of the Company and/or such other person(s) designated in writing as the "Company's Authorized Representative" by the President or any Vice President of the Company.
- C. <u>Contractor</u>. The word "Contractor" means either an individual or other entity employed to do the work as shown on the Construction Drawi ngs and as specified herein.
- D. <u>Construction Drawings</u>. The words "Construction Drawings" mean plans prepared by or on behalf of Arizona Water Company.
- E. <u>Contract</u>. The word "Contract" means the written document titled "Proposal/Contract" when such document has been signed by an officer or other authorized representative of both the Contractor and the Company.

CONSTRUCTION SPECIFICATIONS FOR THE INSTALLATION OF WATER DISTRIBUTION SYSTEMS DUCTILE IRON

1. GENERAL

All work is to be completed in a safe, workmanlike manner and in accordance with these Construction Specifications; any deviation therefrom must be approved in writing by the Company.

Installations must conform with the requirements of all governmental regulating agencies and the cost of conforming to such regulations must be included in the unit bid prices. Examples of such regulations, without attempting to be inclusive, are:

- a. Special compaction and paving for street crossing.
- b. Shoring when required because of the trench depth.
- Closing a trench in those areas where no open trench is allowed overnight.
- d. Barricading and traffic control as required.

2. LOCATION MARKING

Alignment stakes as required in the opinion of the Company shall be furnished by the Company to the Contractor and shall be set by the Company at agreed upon intervals and offsets. Under normal circumstances these will reference the pipeline location five feet (5') into the right-of-way measured from property pins. Grade stakes will be provided only when the Construction Drawings show a pipeline depth other than covered in these Specifications. It is the responsibility of the Contractor to preserve all survey work.

3. TRENCH EXCAVATION

The trench location is to be determined by the Construction Drawings.

FOR 8-INCH OR SMALLER PIPE: The depth of the trench prior to pipe laying shall be such that the finished pipeline shall have between thirty-six inches (36") and forty-two inches (42") of cover unless otherwise specified on the Construction Drawings.

FOR 12-INCH AND LARGER PIPE: The depth of the trench prior to pipe laying shall be such that the finished pipeline shall have between forty-eight inches (48") and sixty inches (60") of cover unless otherwise specified on the Construction Drawings.

The width of the trench at and below the level at the top of the pipe shall be a minimum of twelve inches (12") plus the outside diameter of the pipe barrel and a maximum of twenty-four inches (24") plus the outside diameter of the pipe barrel.

The bottom of the trench shall be accurately graded to provide a uniform bearing for each length of pipe for the full length of the pipe. If the native material on the trench bottom can be reasonably dug by hand, bell holes shall be dug for the joints so that the joints in no way support the pipe. When native materials such as rock are encountered during trenching that will not provide a uniform support for the pipe, the trench will be over-excavated an additional six inches (6") and suitable bedding material will be placed in the trench.

Bedding material will be placed by hand in four-inch (4") lifts and compacted to ensure uniform compaction and to eliminate any voids under the pipe. When the space between the pipe and trench bottom varies, this must be backfilled and compacted in four-inch (4") lifts to the mid-section of the pipe.

Whenever the trench is over-excavated for whatever reason, the trench bottom will be brought up to the correct depth at the Contractor's expense using either method (a) or (b) as follows:

- A.B.C. material shall be used and compacted to a uniform density of not less than 80% of the maximum density as determined by AASHTO T-99 method A and T-191.
- b. Native material 100% of which will pass through a one and one-half inch (1½") screen and at least 20% of which will pass through a number-8 screen shall be used and compacted to a uniform density of not less than 85% of the maximum density as determined by AASHTO T-99 method A and T-191.

4. MATERIALS TO BE PROVIDED BY CONTRACTOR

Unless otherwise specified on the Construction Drawings or in the Contract, the Contractor will supply all of the necessary materials which will become a permanent and integral part of the water distribution system, including concrete blocking, anchors, backfill material, paving material and supplies used during the prosecution of the work. All materials provided by the Contractor to construct the water distribution system must be NSF Standard 61 approved. All potable water pipes and fittings shall have NSF-PW seal. Construction materials used in the water system shall be lead free as defined at AAC R28-4-504 and R18-1-101. The Contractor will provide the following materials:

- a. FIRE HYDRANTS: Mueller Super Centurion 250 Fire Hydrant, meets ANSI/AWWA C502 Standard, Model No. A-423, 5¼" main valve opening, three way, 6" Mechanical Joint Shoe, 1½" pentagon operating nut, color yellow, drain open, open direction left, 4' or 4'6" bury depending on application. For pumper and hose nozzle information see below.
 - (1) 1 4" Pumper Nozzle, NST and 2 2½" Hose Nozzles, NST. (These locations only: Ajo, Casa Grande, Coolidge and San M anuel.)
 - (2) $1-4\frac{1}{2}$ " Pumper Nozzle, NST and $2-2\frac{1}{2}$ " Hose Nozzles, NST. (These locations only: Apache Junction, Arizona City, Lakeside, Oracle, Overgaard, Pinewood, Rimrock, Sedona, Sierra Vista, White Tank and Winkelman.)
 - (3) 1 4½" Pumper Nozzle, NST and 2 2½" Hose Nozzles, NPT (Bisbee only.)
 - (4) 1 3" Pumper Nozzle GA 6-350 (6 threads per inch, 3.50 pitch diameter) and $2 2\frac{1}{2}$ " Hose Nozzles, NPT (Miami only.)

- (5) $1-3\frac{1}{2}$ " Pumper Nozzle GA 6-411 (6 threads per inch, 4.11 pitch diameter) and $2-2\frac{1}{2}$ " Hose Nozzle, NST (Superior only.)
- b. FITTINGS: Manufactured by Tyler or Union. Crosses, Elbows, Tees, Cap, Reducer, Adapter, Plug, Blind Flange and Tapped Flange; Ductile Iron, Class 350, SSB, Cast Iron Cement Lined.
 - (1) Foster Adaptors for MJ, made by Infact Corporation: Available in size 4" to 16". Part No. 4" = 4FA-BC, 6" = 6FA-BC, 8" = 8FA-BC, 10" = 10FA-BC, 12" = 12FA-BC, 16" = 16FA-BC.
- c. DETECTOR CHECK VALVE: Mueller/ Hersey EDC III, iron body, including 5/8" x ¾" Trim Kit. Trim Kit Part No.: 4" = 282080, 6" = 282082, 8" = 282085, 10" = 282496.
- d. GATE VALVES: Mueller Resilient Wedge Gate Valves, meets AWWA C509 specification, 250 psig, Non-rising stem, Part No. A-2360 sizes 4" through 12"; Part No. A-2361 sizes 14" through 36", low zinc stems, epoxy coated inside and outside to meet the NSF 61 rating. The bonnet and stuffing box shall have 304 stainless steel bolts/nuts.
- e. TRACER WIRE and WARNING TAPE:
 - TRACER WIRE: Shall be direct bury AWG #14 solid copper wire, Color: Blue.
 - 2. WARNING TAPE: Reef Industries, Standard Terra Tape in 3" widths. Color: Blue and imprinted 'Arizona Water Company'.
- f. AIR RELEASE VALVE: Crispin Model AR10 with 1" NPT inlet and ½" NPT outlet, cast iron body and top flange; with a 5/64" orifice with stainless steel valve sealing faces and B UNA-N rubber.
- g. PRESSURE RELIEF VALVE: Watts 174A, Model M, 2" inlet, 2" outlet, Bronze Body, 30lb. to 150lb. pressure range.
- h. MEGA LUG: Mechanical Joint restraint made of ductile iron conforming to ASTM 536-80, 250 psi made by EBAA Iron, Inc., series 1100 or equal.
- i. METER BOXES:
 - (1) Concrete Box with a steel regular lid, Number 1: Tucson specification.
 - (2) Concrete Box with a steel regular lid, Number 2, 3, and 4: Phoenix specification.
- j. PIPE, COPPER: Type K soft copper in 60 or 100-foot coils, per ASTM B88.
- k. PIPE, DUCTILE IRON: Ductile Iron Pipe, Cement Lined, Push-on, conform to current ANSI/AWWA Specification A21.51/C151, Pressure Class 350 (sizes 4" through 12"), Pressure Class 250 (sizes 14" through 20"), or Pressure Class 200 for 24" through 36" pipe. Vendors:

- (1) Pacific States Cast Iron Pipe Company
- (2) Griffin Pipe
- (3) United States Pipe and Foundry Company
- (4) American Ductile Iron Pipe
- (5) Clow Pipe (McWane, Inc.)
- I. PIPE, PLASTIC: Plastic pipe, C-900 PVC per ANSI/AWWA C900, Class 150, sizes 6" through 12". NSF61 approved. Furnished in laying lengths of 20'. The barrel shall conform to the outside dimensions of steel pipe (IPS) or cast iron (CI) pipe equivalent and the wall thickness of dimension-ratio (DR) 18.
- m. POLYETHYLENE ENCASEMENT (Polywrap): For all pipeline and related fittings installed, EXCEPT for the Coolidge Division. Minimum 8 Mil. and installed per AWWA C105/A21.5-93 and ASTM A-674-89. Manufactured by the Pacific States Cast Iron Pipe Company. The wrapping tape shall be minimum 10 mil. vinyl tape. No duct tape shall be used.
- n. COUPLING: Mueller, straight three part union, tested to meet ANSI/AWWA C800, H15403, conductive compression.

Mueller, H15428, straight coupling, conductive compression by male iron pipe, tested to meet ANSI/AWWA C800 specification. Size: 2".

Mueller, H15451, straight coupling, conductive compression by female iron pipe, tested to meet ANSI/AWWA C800 specification. Size: 2".

Viking Johnson brand, sold by Mueller: MaxiFit Straight (2"-24"), MaxiFitXtra Straight (4"-8") or MaxiStep Transition, tested to meet AWWA/ANSI C.219-91 specifications – certified to ISO 9001:1994 / Smith – Blair Quantum.

o. STOP, ANGLE METER, BALL: Mueller, valve, B24258, conductive compression by meter swivel nut, tested to meet ANSI/AWWA C800, size 5/8 " x 3/4" x 3/4" for a 3/4" service or size 1" for a 1" service.

Mueller, valve, B24265, female pipe thread by meter swivel nut, tested to meet ANSI/AWWA C800, size 5/8" x $\frac{3}{4}$ " for a $\frac{3}{4}$ " service or size 1" for a 1" service.

p. STOP, CORP: Mueller, ball valve, B25008, taper thread by conductive compression, tested to meet ANSI/AWWA C800 specification, sizes: ¾", 1" and 2".

Mueller, ball valve, B25028, iron pipe thread by conductive compression, tested to meet ANSI/AWWA C800 specification. Sizes 3/4", 1", and 2".

Mueller, 300 Ball Curb Valve, B-25122, taper thread by conductive compression, tested to meet ANSI/AWWA C800 specifications, size: 2". (2" service)

- q. STOP, CURB: Oriseal valve, H10291, iron pipe thread by iron pipe thread, quarter turn check, brass, tested to 300 psi working pressure, tested to meet ANSI/AWWA C800 specification, size: 2".
 - Mueller, B20283, Mueller 300 ball curb valve, female iron pipe by female iron pipe, quarter turn check, tested to meet ANSI/AWWA C800 specification. Size: 2". (Blow-off E-9-8-1).
- r. TAPPING SADDLE: Smith Blair, Cast Bronze ASTM-B584 85-5-5-5, double strap, iron pipe threads, Models 321 and 323. Washers are silicon bronze, ASTM-B36. Gaskets are grade 60 Buna N, or Mueller bronze double strap service saddle, BR 2 B series, cast bronze, ASTM-B585, 85-5-5-5, or H16084, 200 psig, meets ANSI/AWWA C800.
- s. TAPPING SLEEVE: Mueller H304 Stainless Steel Tapping Sleeve, JCM 432 18-8 Type 304 Stainless Steel Tapping Sleeve, Romac "SST" Type 304 Stainless Steel Tapping Sleeve or CASCADE-style CST-EX stainless steel pressure-rated tapping sleeve.
- t. TAPPING VALVE: Mueller Resilient Wedge tapping valve, Catalog Number T-2360-16, Class 125, sizes 4" through 12"; T-2361-16, Class 125, sizes 14" to 36" all with Type 304 stainless steel fasteners; bypass valves are required on 18" 36" valves flange by mechanical joint per ANSI/AWWA C111, iron wedge, non-rising stem. Epoxy coated interior/exterior per ANSI/AWWA C550 for NSF 61 compliance. 250 PSI range for valves 4" to 12". 150 PSI range for valves 14" to 36".
- u. U-BRANCH: Mueller, H15364, 1" male iron pipe by ¾" male iron pipe, tested to meet ANSI/AWWA C800 specification. Size: 1" x ¾" x 13½", straight line.
- VALVE BOXES: Valve Box with Cover, adjustable, Tyler 562-A or equal, made of cast iron.
- w. VAULTS: Utility Vault Company, Chandler, AZ.
 - (1) 4484-WA concrete vault with a 3660 aluminum double torsion door with a recessed padlock hasp, two 18" x 24" center knockouts.
 - (2) 575-WA concrete vault with a 4874 aluminum double torsion door with a recessed padlock hasp, two 18" x 24" center knock outs and adjustable frame.
 - (3) 612-5X-WA concrete vault with a 4874 aluminum double torsion door with a recessed padlock hasp, two 18" x 24" center knockouts.
- x. VALVE, METER: Mueller, B24265-1, Mueller 300 ball angle meter valve, female iron pipe by meter nut, quarter turn check, lock wing, tested to meet ANSI/AWWA C800 specification. Size: 1".

Mueller, B25170, Mueller 300 ball straight valve, conductive compression by female iron pipe, quarter turn check, lock wing, tested to meet ANSI/AWWA C800 specification. Size: 1".

y. YOKES, METER: Relocator type copper meter yoke with horizontal inlet and outlet and meter thread ends, B24118, with lock wing Mueller 300 angle ball valve, full port, sizes: 1" x 12", 5/8" x 3/4" x 7", 5/8 x 3/4" x 9".

Mueller, 2" copper meter yoke with horizontal inlet and outlet and female iron pipe threads, B2423-99000, with lock wing Mueller 300 ball angle meter valves on inlet and outlet risers. Raised 1" by-pass with lock wing Mueller 300 ball valve.

The Contractor also will be required to provide the following materials, the cost of which will be included in its unit bid price:

All material and concrete for thrust blocks, other anchors, reinforcing steel; all gravel, crushed stone, A.B.C., earth, sand, or screened material which may be required; all material for bracing and shoring trenches and for construction of forms; all barricades and traffic control equipment; all material for paving replacement and any water used for compaction of backfill.

5. INSTALLATION OF MATERIALS

All materials are to be installed in accordance with manufacturers recommendations unless otherwise directed by these S pecifications.

All pipe, fittings and valves shall be laid true to the lines, grades and locations established by the Specifications and the Construction Drawings.

The ends and inside of the pipe shall be thoroughly cleaned and inspected for damage. No damaged materials shall be installed in the water distribution system.

Whenever the work ceases for any reason, all open pipeline ends shall be tightly plugged by the Contractor. Plugs shall be watertight and approved by the company.

Concrete thrust blocks of the sizes required by the plans and specifications are to be provided at all valves, changes in direction or size, or at any other point where an unbalanced thrust due to water pressure would exist. Thrust blocks are to be formed to prevent any concrete from spilling over or into a joint.

Trench curves as shown on the Construction Drawings may be made without fittings when using push on joint pipe up to twelve inches (12") in diameter, if the deflection of the pipe does not exceed five degrees (5°) or nineteen inches (19") per eighteen-foot (18') length of pipe. The minimum radius of such curves will be two hundred five feet (205').

Prior to construction, the appropriate agency(ies) will be notified as required by the permit(s).

It shall be the Contractor's responsibility to uncover all existing water lines being connected to, and to verify the location, depth and size of pipe befor e any construction begins.

Any construction performed without the knowledge of the duly authorized representative is liable for removal and replacement at the Contractor's expense.

All fire hydrants, frames, covers and valve boxes, etc. shall be adjusted to finished grade prior to the placing of the asphalt concrete surface course by the Contractor (where applicable).

Air release valves shall be installed at water system high points per Standard Detail E-9-8-2.

All water services shall be set a minimum of two feet (2') on the customer's property, preferably within the P.U.E. and not within right-of-way.

Unless otherwise specified on the construction drawings, all water mains shall be installed five feet (5') from the property line inside the right-of-way or easement.

Water valves shall be spaced not more than five hundred feet (500') in commercial districts and not more than eight hundred feet (800') in other districts. Variations may be required for transmission mains or special applications.

Installation of water line casing shall be per Standard Speci fication E-9-24-1.

Tracer Wire and Warning Tape are to be installed on all mains, tees, crosses, ells and fire hydrant laterals. They will not be installed on service lines. The tracer wire will be installed on the water main 45 degrees from the vertical centerline of the pipe and shall be taped to the fittings directly and on the main every 10 feet using a minimum 10 mil vinyl tape. The tracer wire shall be placed between the valve riser and box with a minimum of 12" of wire inside. The warning tape shall be installed a minimum of two feet below the surface, being measured from final grade, directly over the center of the pipe. Any splices in the tracer wire shall be joined using waterproof connectors. Any splices in the warning tape shall be joined using minimum 10 mil vinyl tape. The tracer wire shall be tested for continuity after backfill and compaction, but before paving. Any detected damages to the wire shall be repaired before paving will be allowed.

6. BACKFILL OF WATER MAIN TRENCHES

Backfill of any excavation shall conform to the requirements of any of the governmental agencies having jurisdiction over the location. If no governmental agency having such jurisdiction specifies backfill or compaction requirements, and no special requirements are shown on the Construction Drawings, the procedure set forth in this section will apply for water line trenches.

The bedding material above the pipe and backfill material shall be compacted to a minimum of 70% compaction within a utility easement and 80% compaction within a right-of-way as determined by AASHTO T-99 method A and T-191. If water settling is used for compaction, it is the responsibility of the Contractor to prevent the pipe from floating.

The bedding material shall be either native material, 100% of which will pass through a one and one-half inch (1½") screen and at least 20% of which will pass through a number-8 screen, or imported material which conforms to M.A.G. specifications for A.B.C. or type-B

select materials. Bedding material shall be used below and around the pipe and a minimum of twelve inches (12") above the pipe. Shade and bedding material to be mechanically compacted prior to remainder of trench back-fill.

The remainder of the trench shall be backfilled with native or imported material which shall be of sound earthen material free from broken concrete, wood, broken pavement, or other unsuitable substances. Except as otherwise specified, backfill may be material containing no pieces larger than six inches (6") in greatest dimension.

Where settlement occurs, additional backfill material shall be placed and compacted and the trench shall be brought to final grade.

7. HYDROSTATIC TESTING OF COMPLETED PIPELINES

Hydrostatic testing of water pipelines will be completed before the new system is connected into the existing water system so that all testing can be done against all new materials.

The completed section of water pipeline to be tested shall be slowly filled with water with care being taken to expel all air from the pipe. If necessary, the pipe will be tapped at high points to vent air.

The Contractor shall provide all equipment and labor necessary to accomplish this testing and the price shall be included in the unit prices. The Contractor shall notify the Company in advance of the testing so that the Company can schedule a duly authorized representative to be at the site during testing. The Contractor, at its own expense, shall make any necessary repairs to the system being tested in order to cause the section being tested to meet the test limits set below. The Contractor may request authorization of the Company to connect the new pipelines to the existing system prior to completion of pressure testing when, in the Company's sole opinion and judgment, conditions warrant such connection.

The Contractor shall assume all responsibility to complete pressure testing to Company's specifications after such connection, including, but not limited to, isolation of the new pipelines from the existing system, if necessary.

Connections prior to completion of pressure testing shall not be made unless prior Company authorization has been obtained, and any extra expenses resulting from such connections shall be the sole responsibility of the Contractor.

Leakage tests will be for a period of two hours at 200 ± 5 psi at the point of lowest elevation; leakage may not exceed 0.1 gallons per hour per one thousand feet (1,000') of pipe per inch of diameter. If dry utilities are not installed, a second pressure test is required.

8. STERILIZATION AND FLUSHING OF COMPLETED WATER PIPELINES

Sterilization and flushing will conform to recommendations of Arizona State Department of Health Services Engineering Bulletin Number 8, latest edition, or any future Arizona Department of Environmental Quality bulletins. Contractor to follow all conditions of any discharge permit.

9. NO OTHER UTILITIES ALLOWED IN OR NEAR WATER PIPELINE TRENCHES

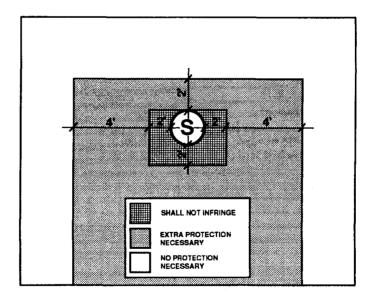
No other utility installations will be permitted in the water pipeline trench or within five feet (5') of the Company's water pipeline when running pa rallel to the water pipelines.

10. PROTECTION OF WATER MAINS NEAR SEWERS

In order to protect water mains from contamination by sewers, the installation of the water mains must conform to the following requirements:

a. Horizontal - When water lines and sewers are laid parallel with each other, the horizontal distance between them shall not be less than six feet (6'). Each line shall be laid on undisturbed or bedded material in a separate trench. Where conditions prevent the minimum horizontal separation set forth above, extra protection will be required. Extra protection shall consist of constructing the sewer main with mechanical joint ductile iron pipe or with slip-joint ductile iron pipe if joint restraint is provided, or encasing the sewer main in concrete. Extra protection shall consist of constructing the water main with mechanical joint ductile iron pipe or with slip-joint ductile pipe if joint restraint is provided. The water main shall not be encased in concrete.

The Construction Drawings shall indicate the installation requirements. The drawings showing these exceptions shall have been approved by the appropriate state and/or county health department. Refer to the diagram below f or clarification.



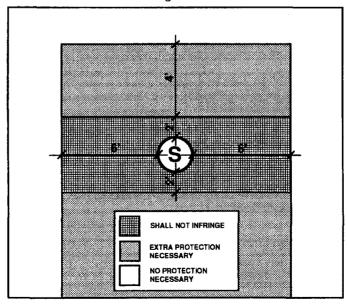
Under no circumstances will the horizontal separation between sewer mains and water mains be less than two feet (2'). All distances are to be measured from the outside of the sewer main to the outside of the water main.

b. Vertical - When a water main is parallel with or crosses a sewer main within two feet (2') above the sewer or greater than two feet (2') below the sewer, extra protection will be required. Extra protection shall consist of constructing the sewer main with mechanical joint ductile iron pipe or with slip-joint ductile iron pipe if joint restraint is provided, or encasing the sewer main in concrete. Extra protection shall consist of constructing the water main with mechanical joint ductile iron pipe or with slip-joint ductile pipe if joint restraint is provided. The water main shall not be encased in concrete.

The Construction Drawings shall indicate the installation requirements. The drawings showing these exceptions shall have been approved by the appropriate state and/or county health department.

Under no circumstances will the vertical separation of a sewer main installed above a water main be less than two feet (2'). All distances are to be measured from the outside of the sewer main to the outside of the water main. Refer to the diagram above for clarification.

- c. When unusual conditions such as, but not limited to, highway or bridge crossings prevent the water and sewer main separations required from being met, the appropriate state and/or county health department will review and may approve requests for authorization to use alternate construction techniques, materials and joints on a case-by-case basis.
- d. No water pipe shall pass through or come into contact with any part of a sewer manhole. The minimum horizontal separation between water mains and manholes shall be six feet (6'), measured from the center of the manhole.
- e. The minimum separation between force mains or pressure sewers and water mains shall be two feet (2') vertically and six feet (6') horizontally under all conditions. Where a sewer force main crosses above, or less than six feet (6') below, a water line, the sewer main shall be encased in at least six inches (6") of concrete for ten feet (10') on either side of the water main. Refer to the diagram below for clarification.



- f. Sewer mains (gravity, pressure, force) shall be kept a minimum of fifty feet (50') from drinking water wells, unless the following conditions are met:
 - Water main pipe, pressure tested in place to 50 psi without excessive leakage, may be used for gravity sewers at distances greater than twenty feet (20') from drinking water wells.
 - 2. Water main pipe, pressure tested in place to 150 psi without excessive leakage, may be used for pressure sewers and force mains at distances greater than twenty feet (20') from drinking water wells.
- g. No septic tank/disposal field system shall be constructed within one hundred feet (100') of a drinking water well.
- h. All distances are measured perpendicularly from the outside of the sewer main to the outside of the water main. These separation requirements do not apply to building, plumbing or individual house service connections.
- Use Mechanical Joint ductile iron pipe with Megalug thrust restraints a minimum of ten (10') feet on each side of a sewer or storm drain crossing.

11. COMPACTION

When crossing existing water mains a minimum of 95% compaction is required to the bottom of existing mains.

Arizona Water Company requires that no slurry be permitted to contact existing cement/asbestos or ductile iron pipes, unless authorized by the company. Slurry may be poured in the bottom of the sewer trench stopping three inches (3") below the existing water main. The backfill used around the main should be AB in sufficient depth to prevent slurry from contacting existing main.

12. WATER MAIN MATERIAL SPECIFICATIONS

Ductile iron pipe (Push-on type) minimum class 350, cement lined and conform to AWWA C151.

All main line valves shall conform to AWWA C500 with a minimum working pressure of 200 psi.

All cast iron fittings to be cement lined in accordance with AWWA C104 and shall conform to AWWA C110 with a minimum working pressure of 250 psi. Except for the Coolidge System – See Note 4L.

Maximum joint deflection for 6" mechanical joint ductile iron pipe is seven degrees, seven minutes (7°, 7') or twenty-seven inches (27") per eighteen-foot (18') length pipe, for a maximum curve of one hundred forty-five feet (145').

Maximum joint deflection for 8" and 12" mechanical joint ductile iron pipe is five degrees, twenty-one minutes (5° 21') or twenty inches (20") per eighteen-foot (18') length pipe, for a maximum curve of one hundred ninety-five feet (195').

Maximum joint deflection for 6", 8" and 12" push-on joint ductile iron pipe is five degrees (5°) or nineteen inches (19") per eighteen-foot (18') length pipe for a maximum curve of two hundred five feet (205').

ARIZONA WATER COMPANY

STANDARD SPECIFICATION DRAWINGS: E-9-1

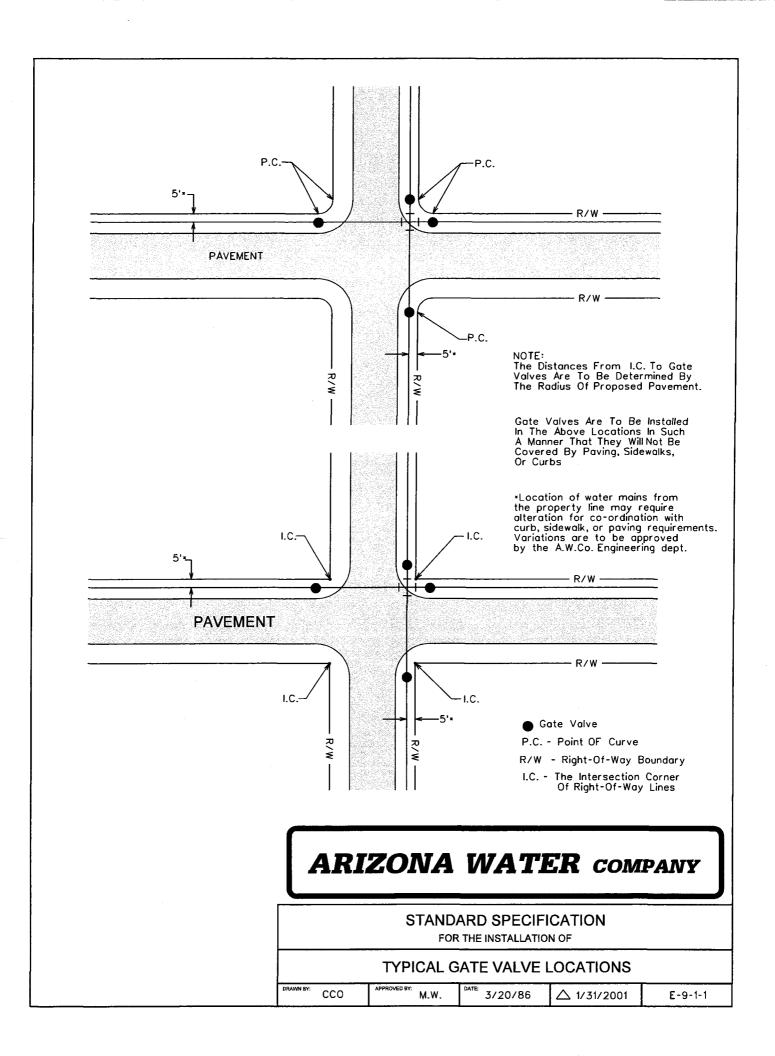
ARIZONA WATER COMPANY

STANDARD SPECIFICATION DRAWINGS

INDEX (E-9)

E-9-1	TYPICAL GATE VALVE LOCATIONS
E-9-2	INSTALLATION OF TYPICAL VERTICAL AND HORIZONTAL GATE VALVES
E-9-3	INSTALLATION OF TYPICAL TAPPING SLEEVE AND VALVE
E-9-4	INSTALLATION OF TYPICAL VALVE SUBJECT TO NON-VEHICULAR AND VEHICULAR TRAFFIC
E-9-5	INSTALLATION OF TYPICAL THRUST BLOCKING SCHEDULE, THRUST BLOCK FOR VERTICAL BENDS, AND MEGALUG THRUST RESTRAINTS
E-9-6	INSTALLATION OF TYPICAL PERPENDICULAR FIRE HYDRANT
E-9-7	INSTALLATION OF TYPICAL PARALLEL FIRE HYDRANT
E-9-8	INSTALLATION OF TYPICAL 2" BLOWOFF DEVICE, AND AIR RELEASE VALVE
E-9-9	INSTALLATION OF TYPICAL SINGLE SERVICE CONNECTION FOR A $^3/_4{}^{\shortparallel}$ OR 1" METER
E-9-10	INSTALLATION OF TYPICAL DOUBLE SERVICE CONNECTION FOR A $^3/_4{}^{\shortparallel}$ AND 1" METER
E-9-11	INSTALLATION OF TYPICAL 2" SERVICE CONNECTION
E-9-12	INSTALLATION OF 3" COMPOUND METER, 4" COMPOUND METER, 6" COMPOUND METER, 6" COMPOUND SERVICE, CONCRETE VAULT, AND NON-POTABLE PROPELLER METER
E-9-13	INSTALLATION OF TYPICAL 4" THRU 8" DETECTOR CHECK VALVES AND 3" THRU 10" REDUCED PRESSURE PRINCIPLE DETECTOR WITH BYPASS METER ASSEMBLY (RPDA) FOR FIRE LINE SERVICES
E-9-14	INSTALLATION OF TYPICAL PRESSURE RELIEF VALVE ASSEMBLY
E-9-15	INSTALLATION OF TYPICAL PRESSURE REDUCING STATION
E-9-16	PAINT COLOR SELECTION
E-9-17	STEEL WATER STORAGE TANK
E-9-18	HYDROPNEUMATIC TANK
E-9-19	INSTALLATION OF WELL SHELTER

E-9-20	INSTALLATION OF TYPICAL WELL WITH LINE SHAFT TURBINE PUMP
E-9-21	INSTALLATION OF TYPICAL WELL WITH SUBMERSIBLE TURBINE PUMP
E-9-22	INSTALLATION OF COLUMN PIPE, OIL TUBE AND LINE SHAFT
E-9-23	HOT TAP AND JUMPER METER CONNECTION
E-9-24	INSTALLATION OF TYPICAL WATER LINE ENCASEMENT
E-9-25	INSTALLATION OF CALCIUM HYPOCHLORITE TABLET CHLORINATOR
E-9-26	INSTALLATION OF CHAIN LINK FENCE
E-9-27	INSTALLATION OF SIDE HUNG WATER LINE SUSPENSION
E-9-28	PIPE WARNING TAPE, LOCATOR WIRE, AND LOCATOR WIRE TERMINATION
E-9-29	INSTALLATION OF A TYPICAL SAMPLING STATION

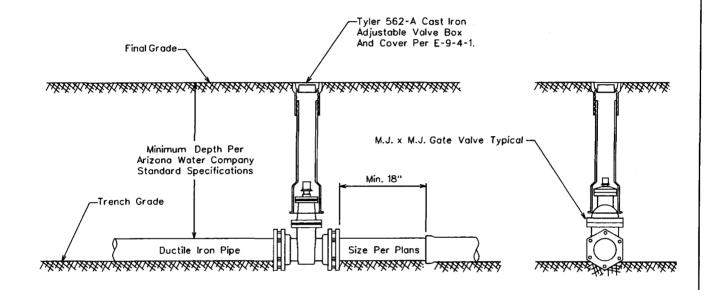


FOR 6" THROUGH 12" GATE VALVES

Mueller Resiliant Wedge Gate Valves Catalog Number A-2360-__ ANSI/AWWA C509 Compliant

FOR 14" THROUGH 16" GATE VALVES

Mueller Resiliant Wedge Gate Valves Catalog Number A-2361-_ ANSI/AWWA C509 Compliant



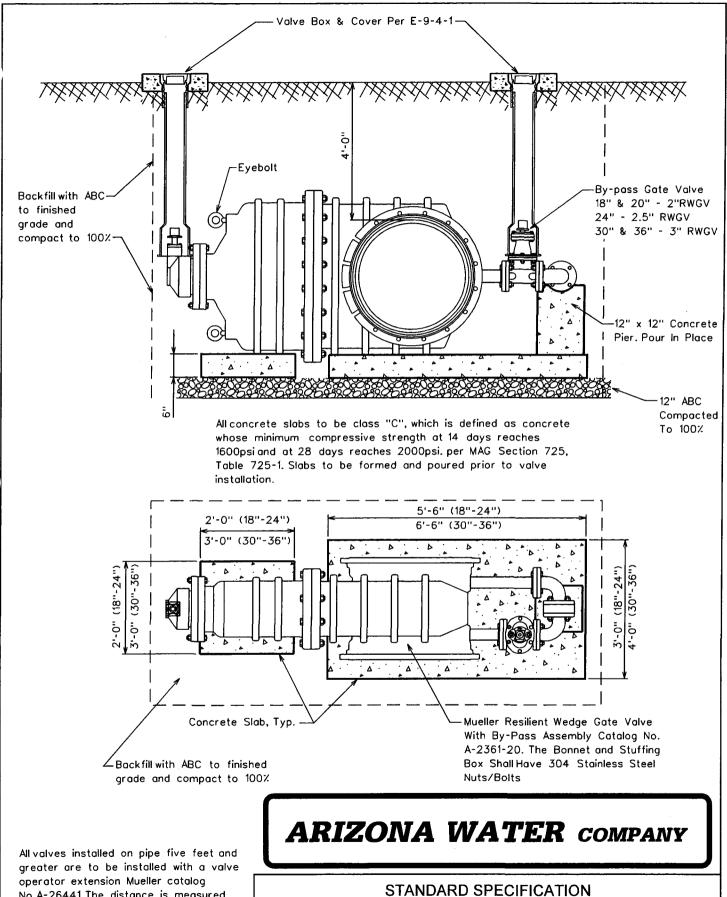
All Valves Installed On Pipe Five Feet (5') Deep And Greater Are To Be Installed With A Valve Operator Extension, Mueller Catalog No. A-26441.

ARIZONA WATER COMPANY

STANDARD SPECIFICATION FOR THE INSTALLATION OF

TYPICAL VERTICAL GATE VALVES

DRAWN BY: CB APPROVED BY: MW DATE 0.3.20.1986 \(\triangle 0.8.23.2006 \) E-9-2-1

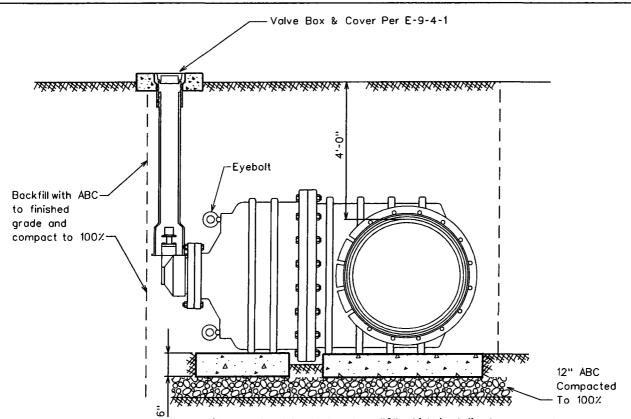


No.A-26441 The distance is measured from the top of the operating nut to final grade.

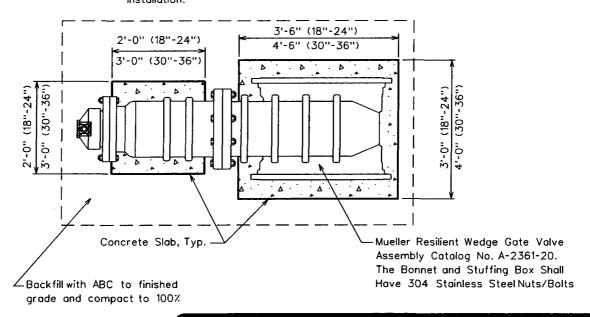
FOR THE INSTALLATION OF

INSTALLATION OF BEVEL GEARED HORIZONTAL GATE VALVES WITH BY-PASS FOR 18" AND LARGER VALVES

DRAWN BY: 12.07.2004 E-9-2-2 CB



All concrete slabs to be class "C", which is defined as concrete whose minimum compressive strength at 14 days reaches 1600psi and at 28 days reaches 2000psi. per MAG Section 725, Table 725-1. Slabs to be formed and poured prior to valve installation.



All valves installed on pipe five feet and greater are to be installed with a valve operator extension Mueller catalog No.A-26441 The distance is measured from the top of the operating nut to final grade.

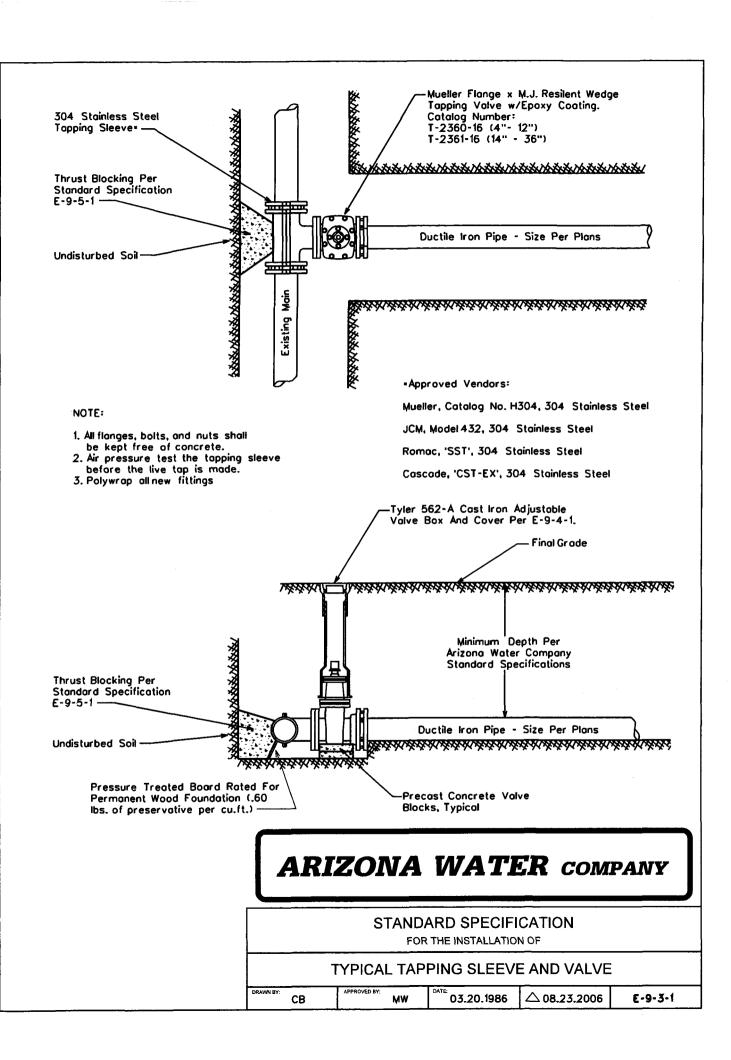
ARIZONA WATER COMPANY

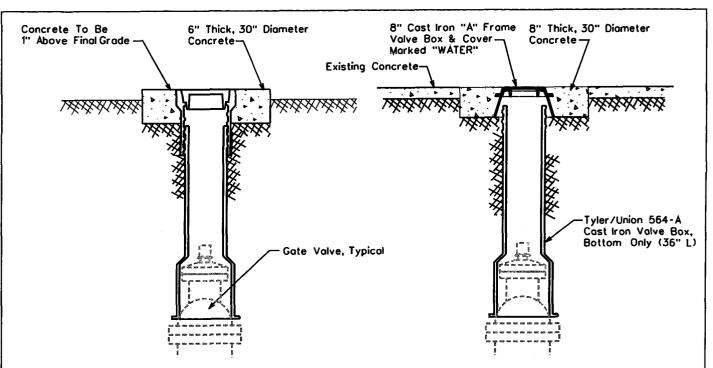
STANDARD SPECIFICATION

FOR THE INSTALLATION OF

INSTALLATION OF BEVEL GEARED HORIZONTAL GATE VALVES WITHOUT A BY-PASS FOR 18" AND LARGER VALVES

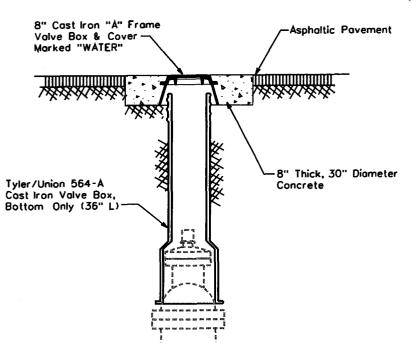
CB APPROVED BY: DATE: 12.07.2004 \(\triangle 5.13.2005 \) E-9-2-3





NON-VEHICULAR VALVE BOX

CONCRETE VALVE BOX For Areas Subject To Vehicular Traffic



NOTE:

- The Valve Box Shall Be Adjusted To Finished Grade Prior To Placing Of Asphalt And/Or Concrete.
- 2. For Non-Traffic Areas Use Tyler/Union 562-A, Two-Piece, 6855 Series Or Equivalent Adjustable Cast Iron Valve Box And Cover, Valves 4" To 12"

For Traffic Areas, Use Tyler/Union 564-A Bottom Section Only With An 8" Cost Iron "A" Frame With Cover. Valves 4" To 12"

- All Valves Installed Five Feet (5') Deep And Greater Are To Be Installed With A Valve Operator Extension, Mueller Catalog No. A-26441 And Shall Have A Debris Cap
- 4. Use Minimum Class 'C' Concrete which is defined as concrete whose minimum compressive strength at 14 days reaches 1600psi and at 28 days reaches 2000psi. per MAG Section 725, Table 725-1.

ASPHALT VALVE BOX
For Areas Subject To Vehicular Traffic

ARIZONA WATER COMPANY

STANDARD SPECIFICATION

FOR THE INSTALLATION OF

TYPICAL VALVE SUBJECT TO NON-VEHICULAR AND VEHICULAR TRAFFIC

DRAWN BY:

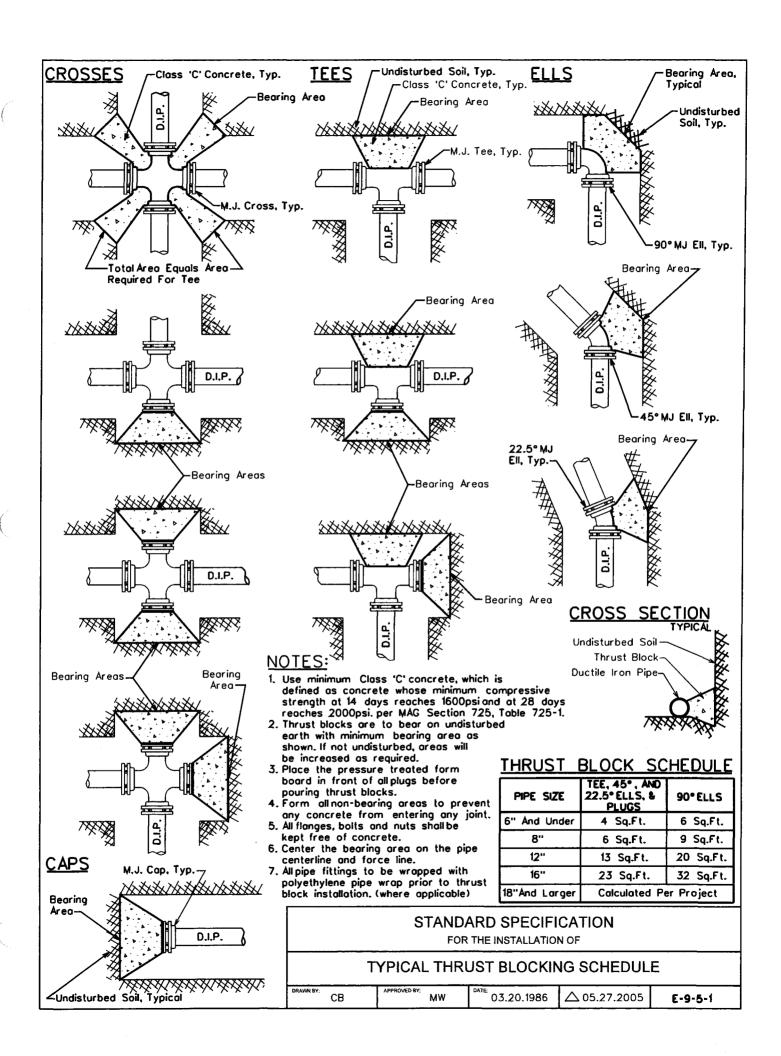
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MW

03.20.1986

△ 8.24.2006

E-9-4-1

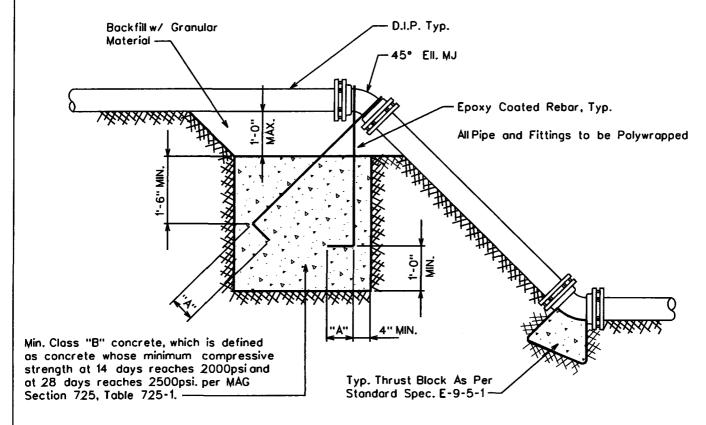


NOTES

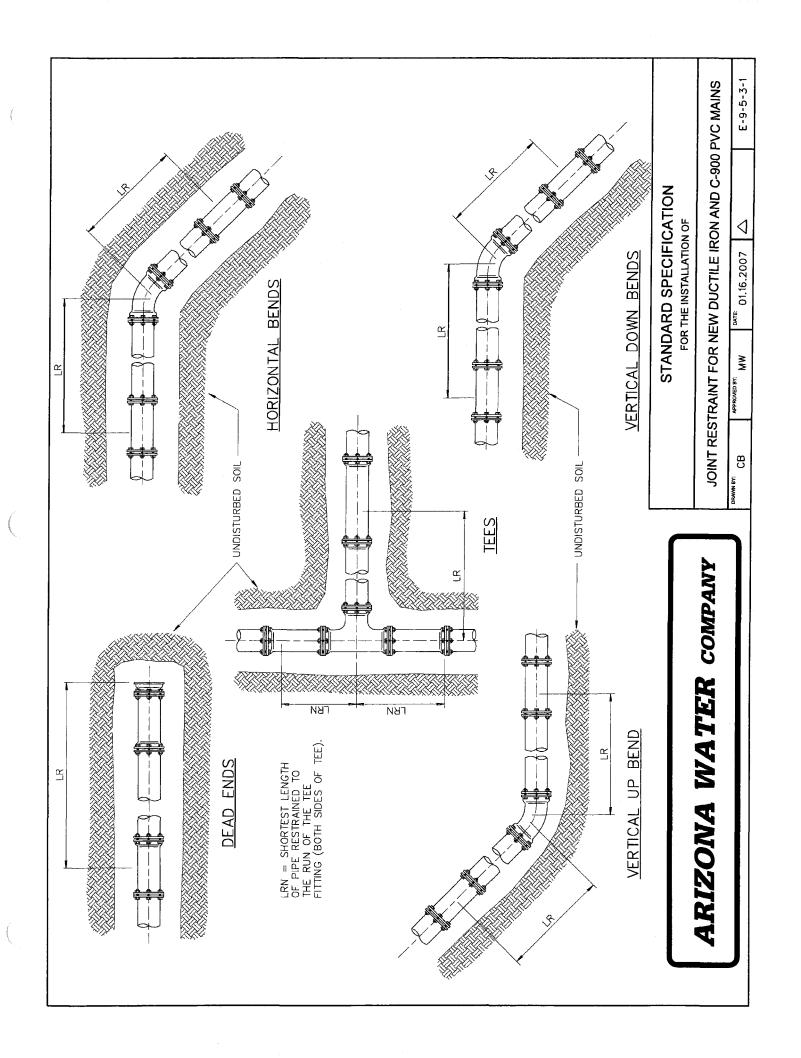
- Bars In Conc. Thrust Block To Be Coated w/ 2 Coats Coal Tar Epoxy or by Other Approved Method.
- 2. Bars To Have 90° Hook © Their Ends, As Per Table Below.

Pipe Size	Min. Bar Size	"A" Dimension (Hook)	Min. BlockDimension(WxHxL)
6"	•6	6"	3'×3'×3'
8"	•6	9"	4'x3'x4'
12"	•8	9"	5'x4'x5'
16"	•9	12"	7'×6'×7'

* For 125 P.S.I. Working Pressure



ARIZONA WATER COMPANY



		DEAD	ENDS		31	44	58	69	8	92	104	115	126	147
		AD FITTINGS	٥	BEND	3	5	9	8	6	10	11	12	14	16
		45' BEND FITTINGS 22-1/2' BEND FITTINGS	INWOOD	BEND	9	6	11	14	16	18	21	23	25	29
A PIPE	OFFSETS	FITTINGS	<u></u>	BEND	7	10	13	16	19	21	24	26	28	33
TLE IRON	VERTICAL OFFSETS	45. BEND	NWOO	BEND	13	18	24	29	34	38	43	48	52	61
DUC AC	\	90' BEND FITTINGS	dn	BEND	82	25	32	38	45	51	25	62	89	62
RESTRAINED LENGTHS, LR, FOR DUCTILE IRON PIPE		90, BEND	NWOO	BEND	31	44	58	69	81	92	104	115	126	147
		TEES		LRN=10'	8	20	34	45	57	68	79	90	100	121
AINED L	Ē	<u> </u>		LRN=0'	30	43	56	68	80	91	103	113	125	145
RESTRA	, C	SENDS		22-1/2.	4	5	9	8	6	10	11	12	14	16
	FIAC	HORIZONTAL BENDS		42.	7	10	13	16	19	21	24	56	28	33
	700	71200		.06	18	25	32	38	45	51	57	62	68	79
	NOMINAL	7.F.F.	3175	INCHES	4	9	8	10	12	14	16	18	20	24

		_		_	_		_		_	_		_	_	_
		!	7.2	102	133	150	187	214	241	266	202	340		
WRAP		ND FITTINGS		BEND	5	7	6.	1	13	15	16	18	20	22
LENGTHS, LR, FOR DUCTILE IRON PIPE WITH POLYETHYLENE WRAP		22-1/2' BEND FITTINGS	NWCC.	BEND	14	20	26	32	37	42	48	53	58	68
OLYET	OFFSETS	45' BEND FITTINGS	ā	BEND	11	15	19	23	27	31	34	38	41	47
WITH	VERTICAL OFFSETS	45° BEND	NWOO	BEND	30	42	55	99	77	89	100	110	121	141
ON PIPE	>	FITTINGS	<u>a</u> .	BEND	26	36	47	56	65	74	82	96	98	113
CTILE IR		90. BEND	NMCC	BEND	72	102	133	159	187	214	241	266	292	340
FOR DU		TEES		LRN=10,	18	47	78	103	131	156	183	207	233	280
IS, LR,		<u> </u>		LRN=0	69	66	130	157	185	211	238	263	289	337
LENGTH	טטוערט	HORIZONTAL BENDS		22-1/2	5	7	6	11	13	15	16	18	20	22
AINED				45.	11	15	19	23	27	31	34	37	41	47
RESTRAINED	10017	אַואַסר		.06	26	36	47	99	65	74	82	06	86	113
	NOMINAL	77.0	3125	INCHES	4	9	ထ	10	12	14	16	18	20	24

- 1. ALL JOINTS WITHIN THE SPECIFIED LENGTH LR MUST BE RESTRAINED. ALL LENGTHS ARE GIVEN IN FEET.
- 2. THE MAXIMUM TEST PRESSURE SHALL NOT EXCEED 200 PSI
- 3. THE MINIMUM DEPTH OF BURY SHALL BE 3' TO TOP OF PIPE.
- 4. RESTRAINED LENGTHS MAY BE REDUCED WHEN SUPPORTED BY ENGINEERING CALCULATIONS.

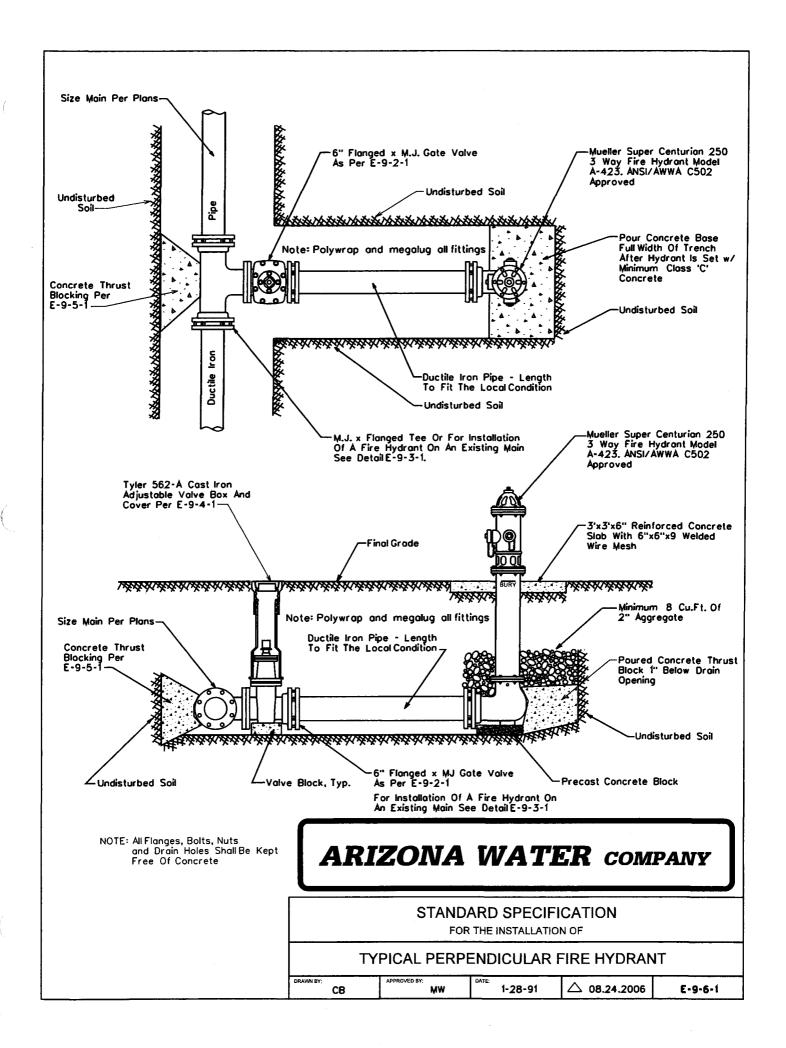
ARIZONA WATER COMPANY

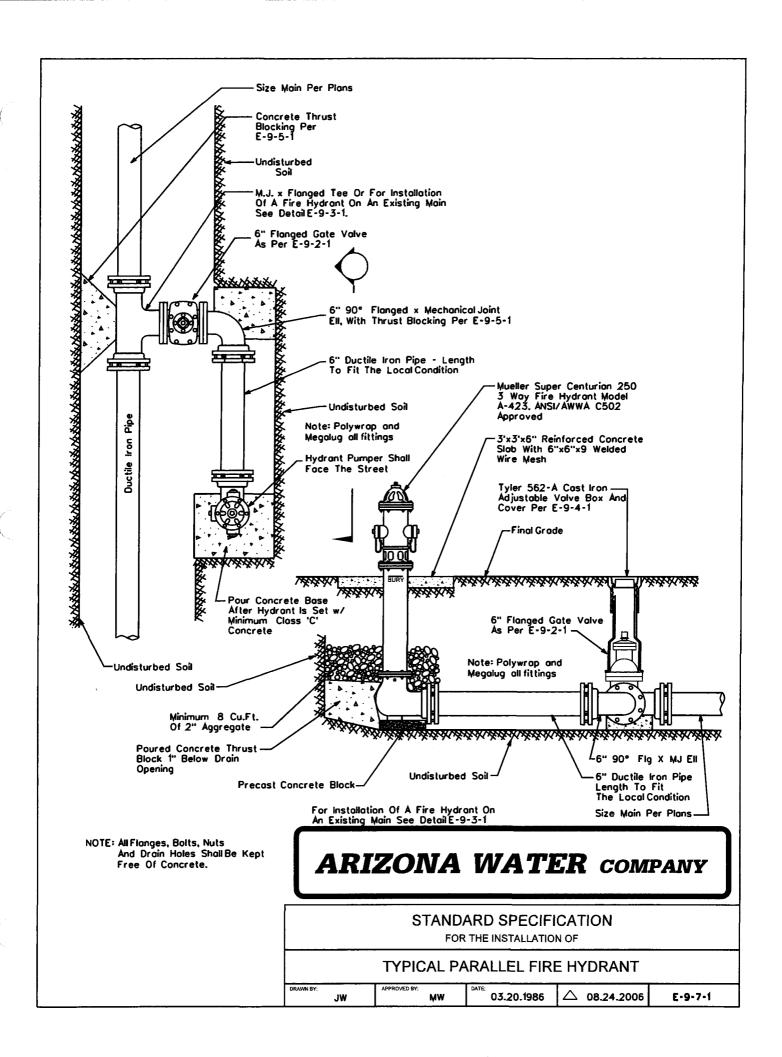
STANDARD SPECIFICATION

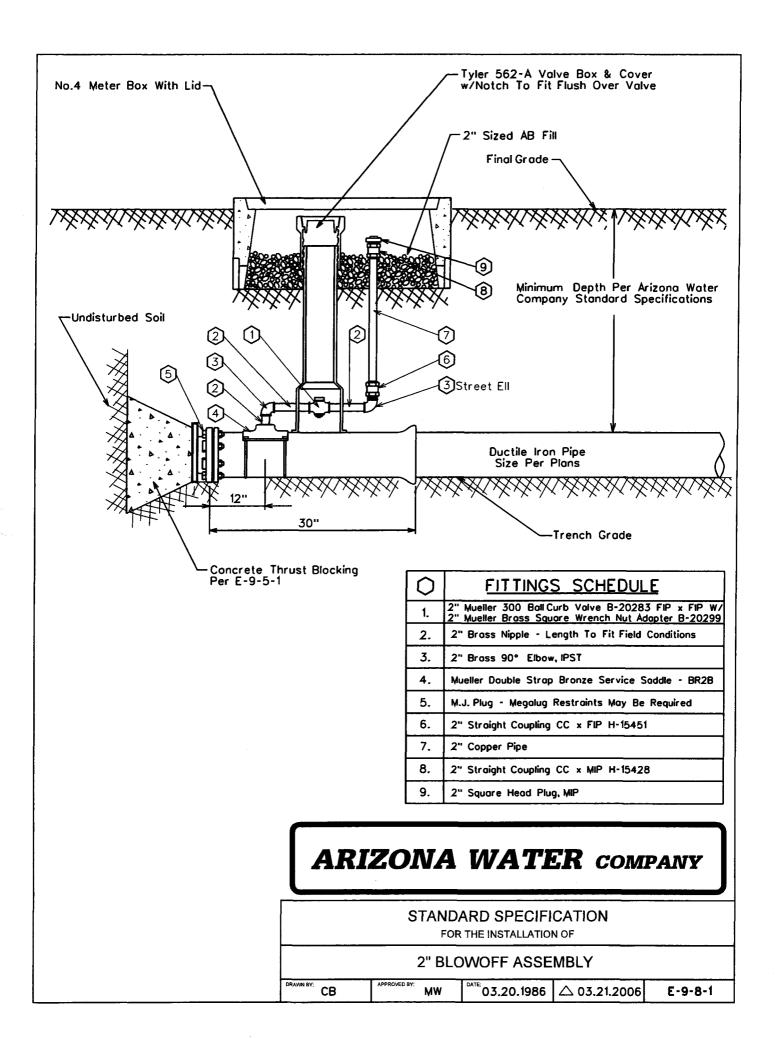
FOR THE INSTALLATION OF

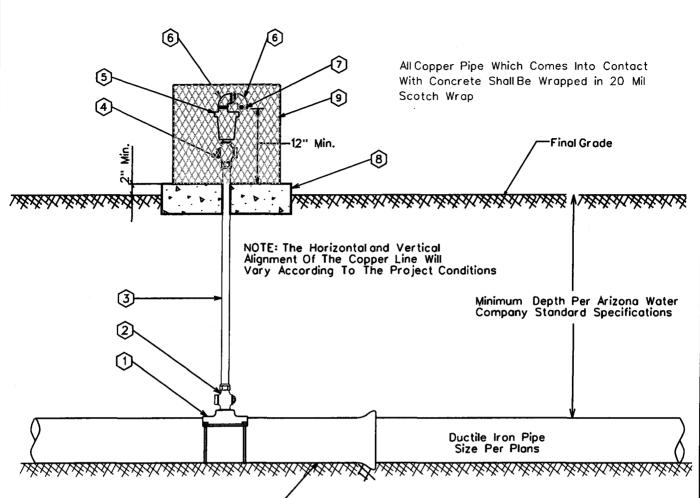
JOINT RESTRAINT FOR NEW DUCTILE IRON AND C-900 PVC MAINS

	01.16.2007 △ E-9-5-3-2	
APPROVED 8Y: DATE:		
DRAWN BY:	B	









GENERAL NOTES:

 The valve shall be installed at high points and on long runs to vent the accumulation of air with the line under pressure- see the construction plans for specific locations.

Trench Grade

- 2. The valve shall have a 3/4" orifice with valve sealing faces of stainless steel and BUNA-N rubber.
- The valve shall be Crispin model AR10 for 6" and larger water mains.
- 4. Crispin model AR10 valve construction consists of a 1" IPST inlet & $\frac{1}{2}$ " IPST outlet, cast iron body and top flange with stainless steel float and trim.
- 5. The air release assembly shall be located out of the path of traffic but within right-of-way or easement.

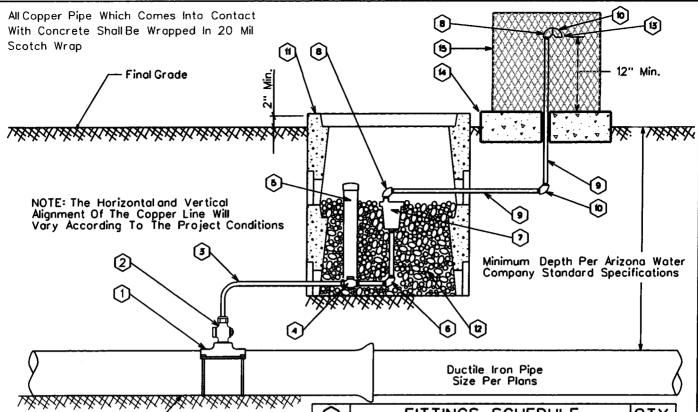
0	FITTINGS SCHEDULE
1.	Mueller BR2B Bronze Service Saddle - Double Strap
2.	1" Mueller B-25008 Taper x Comp. Ball Corp Stop
3.	1" Type 'K' Copper w/NO Splices - Field Fit
4.	1" Mueller B-25028 IP x Comp. Ball Corp Stop
5.	Crispin 1" Air Release Valve, Model AR10
6.	1/2" Brass Street Elbow
7.	No.16 Wire Mesh Screen (Non-Corrodible)
8.	4" Thick Concrete Pad - Class 'C' Concrete
9.	Guardshack, Model GS-1, Ávailable From BPDI, Inc. Ávailable in Leaf Green Or Desert Tan

ARIZONA WATER COMPANY

STANDARD SPECIFICATION FOR THE INSTALLATION OF

TYPICAL AIR RELEASE VALVE

CB APPROVED BY: MW DATE: 03.20.1997 \(\triangle 08.24.2006 \) E-9-8-2



GENERAL NOTES:

Trench Grade

- The valve shall be installed at high points and on long runs to vent the accumulation of air with the line under pressure- see the construction plans for specific locations.
- The valve shall have a ¼ " orifice with valve sealing faces of stainless steel and BUNA-N rubber.
- 3. The valve shall be Crispin model AR10 for 6" and larger water mains.
- 4. Crispin model AR10 valve construction consists of a 1" IPST inlet & ½" IPST outlet, cast iron body and top flange with stainless steel float and trim,
- The air release assembly shall be located out of the path of traffic but within the right-of-way or easement.

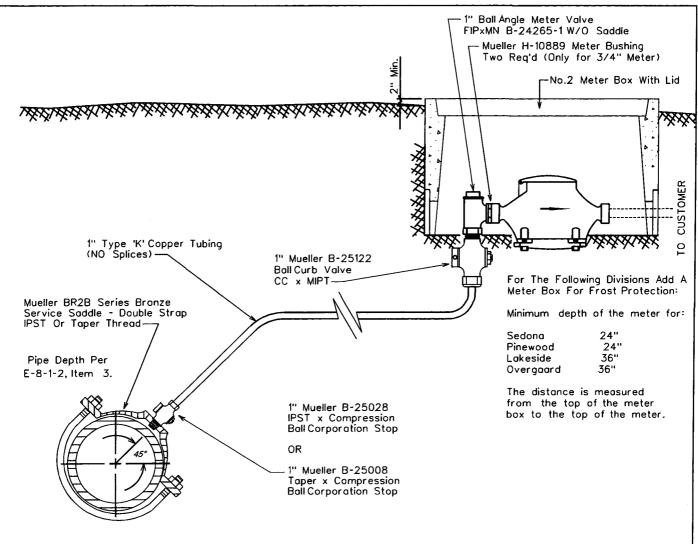
	FITTINGS SCHEDULE	QTY.
1,	Mueller BR2B Bronze Service Saddle - Double Strap	1
2.	1" Mueller B-25008 Taper x Comp. Ball Corp Stop	1
3.	1" Type 'K' Copper w/NO Splices - Field Fit	As Regid
4.	1" Mueller B-25028 IP x Comp. Ball Corp Stop	1
5.	3" PVC Pipe w/ Cap (Loose Fit)	1
6.	1" x 4" Brass Nipple w/90° Elbow	1
7.	Crispin 1" Air Release Valve, Model AR10	1
8.	1/2" Brass Street Elbow	, 2
9.	1/2" Galvanized Pipe - Length as req'd	2
10.	1/2" Galvanized 90° Ell	2
11,	Number 1 Meter Box	2
12.	2" Sized AB (Fill Meter Box To The Top Of The Air Release Valve)	As Req'd
13.	No.16 Wire Mesh Screen (Non-Corrodible)	1
14.	4" Thick Concrete Pad - Class 'C' Concrete	1
15.	Guardshack, Model GS-1, Available From BPDI, Inc. Available In Leaf Green Or Desert Tan	1

ARIZONA WATER COMPANY

STANDARD SPECIFICATION FOR THE INSTALLATION OF

AIR RELEASE VALVE FOR THE NORTHERN REGION

CB APPROVED BY: MW DATE: 03.20.1997 \(\triangle 08.24.2006 \) E-9-8-3



SADDLE TAP TO CA, PVC, OR DIPIPE

NOTE: The minimum distance between taps on mains other than ductile iron is 12"

NOTE: Only the meter is supplied by Arizona Water Company

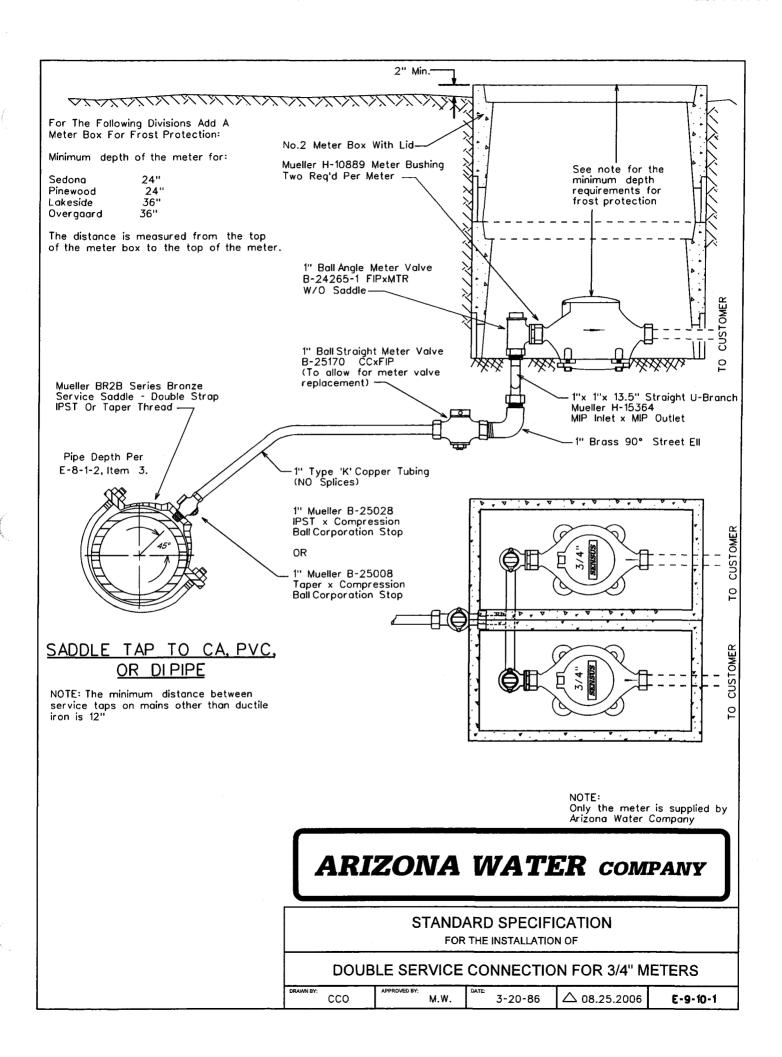
ARIZONA WATER COMPANY

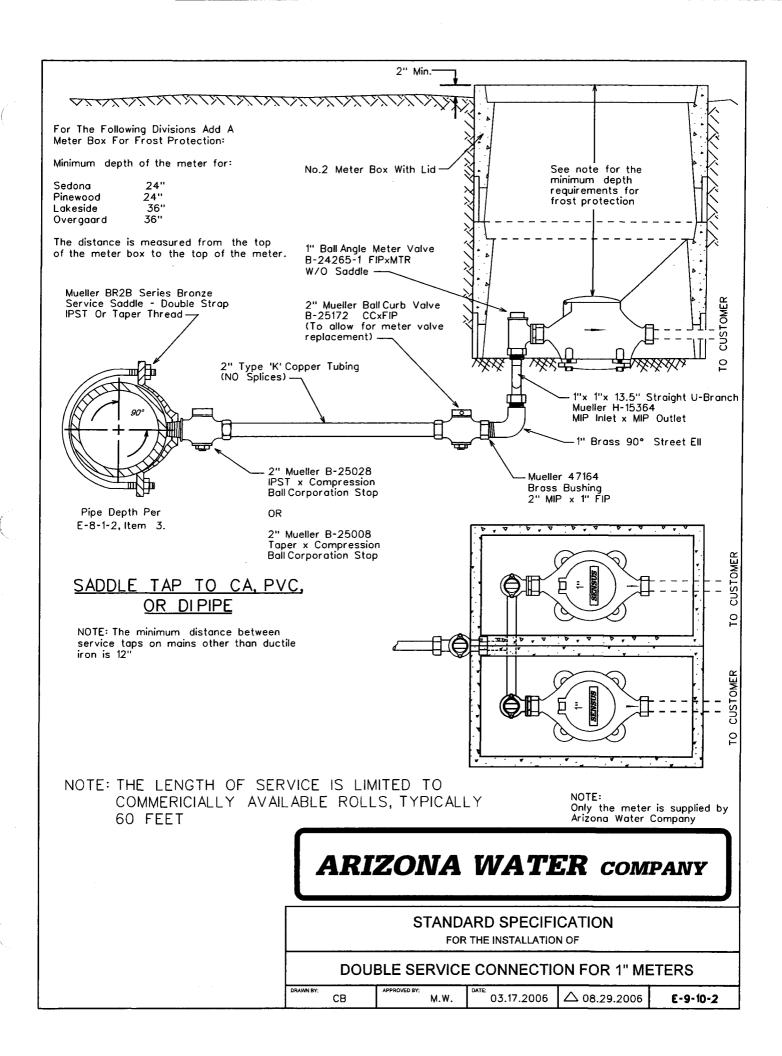
STANDARD SPECIFICATION

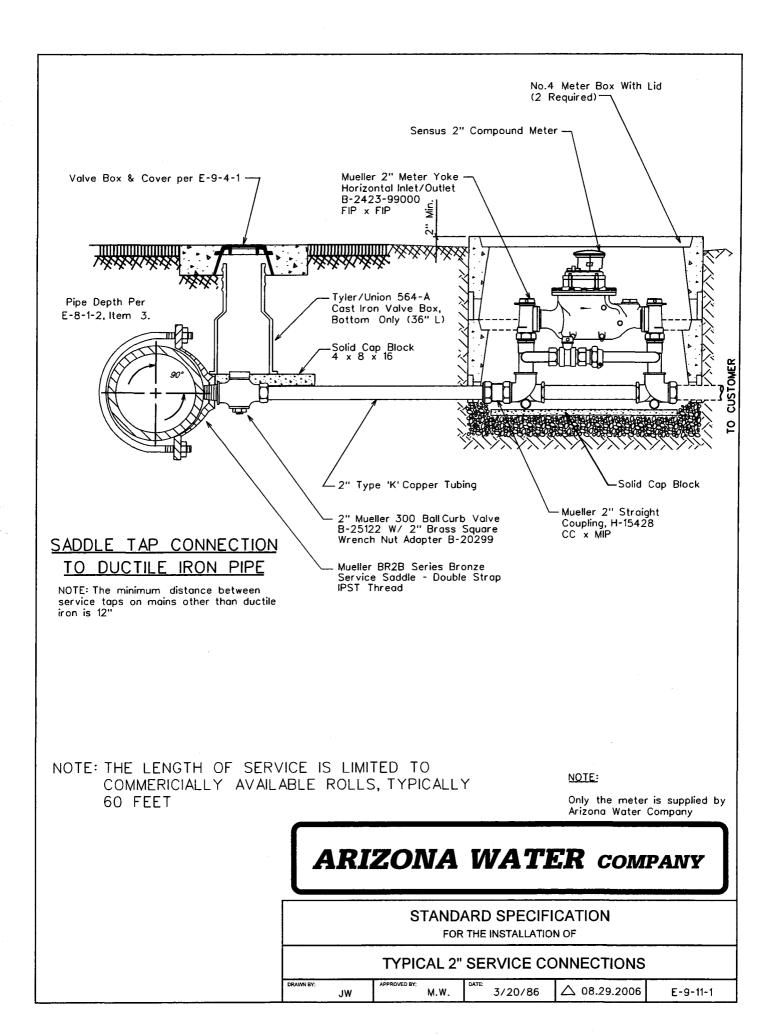
FOR THE INSTALLATION OF

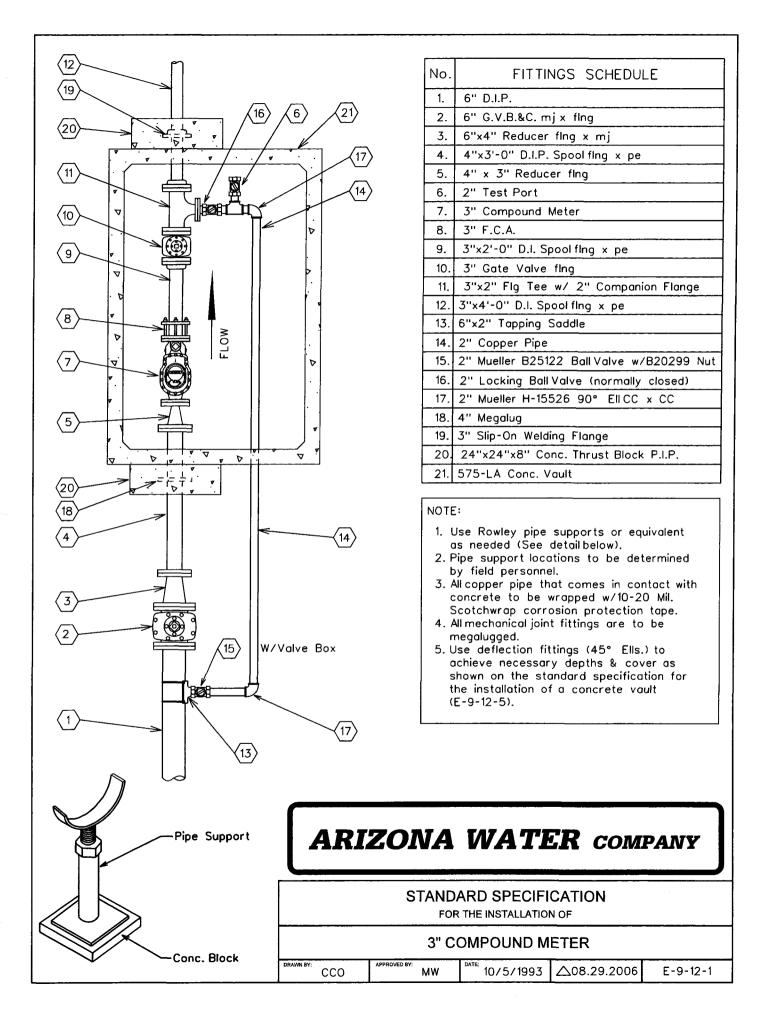
SINGLE SERVICE CONNECTION FOR A 3/4" OR 1" METER

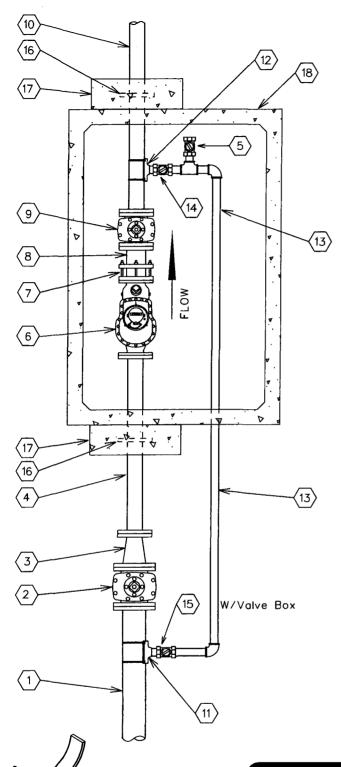
DRAWN BY: CCO APPROVED BY: M.W. DATE: 3/20/86 \(\triangle 03.17.2006 \) E-9-9-1





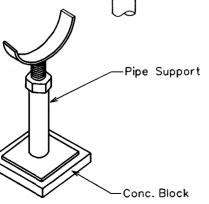






No.	FITTINGS SCHEDULE
1.	6" D.I.P.
2.	6" G.V.B.&C. mj x flng
3.	6"x4" Reducer flng x mj
4.	4"x3'-0" D.I.P. Spool flng x pe
5.	2" Test Port
6.	4" Compound Meter
7.	4" F.C.A.
8.	4"x1'-0" D.I.P. Spool flng x pe
9.	4" Gate Valve flng
10.	4"x4'-0" D.I.P. Spool flng x pe
11.	6"x2" Tapping Saddle
12.	4"x2" Tapping Saddle
13.	2" Copper Pipe
14.	2" Ball Valve / Locking (Normally Closed)
15.	2" Mueller B25122 Ball Valve w/B20299 Nut
16.	4" Megalug
17.	24"x24"x8" Conc. Thrust Block P.I.P.
18.	575-LA Conc. Vault

- 1. Use Rowley pipe supports or equivalent as needed (See detail below).
- 2. Pipe support locations to be determined by field personnel.
- 3. All copper pipe that comes in contact with concrete to be wrapped w/10-20 Mil. Scotchwrap corrosion protection tape.
- 4. All mechanical joint fittings are to be megalugged.
- 5. Use deflection fittings (45° Ells.) to achieve necessary depths & cover as shown on the standard specification for the installation of a concrete vault (E-9-12-5).



ARIZONA WATER COMPANY

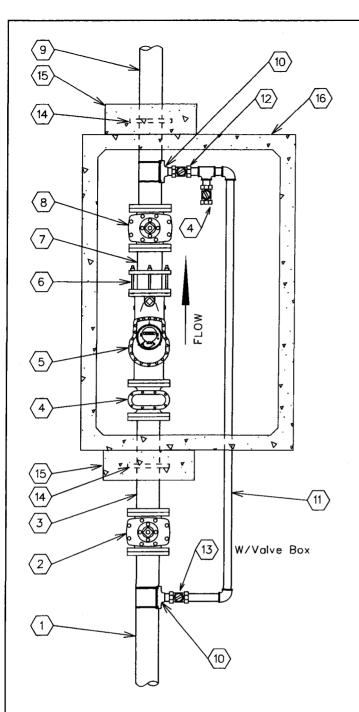
STANDARD SPECIFICATION

FOR THE INSTALLATION OF

4" COMPOUND METER

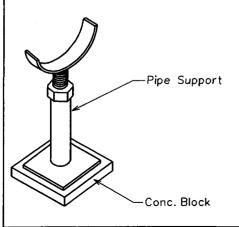
E-9-12-2

CCO APPROVED BY: MW DATE: 10/5/1993 \(\triangle 08.29.2006 \)



No.	FITTINGS SCHEDULE
1.	6" D.I.P.
2.	6" G.V.B.&C. mj
3.	6"x 3'-0" D.I.P. Spool flng x pe
4.	2" Test Port
5.	6" Compound Meter
6.	6" F.C.A.
7.	6"x 1'-0" D.I.P. Spool flng x pe
8.	6" Gate Valve fing
9.	6"x 4'-0" D.I.P. Spool flng x pe
10.	6"x2" Tapping Saddle
11.	2" Copper Pipe
12.	2" Ball Valve / Locking (Normally Closed)
13.	2" Mueller B25122 Ball Valve w/B20299 Nut
14.	6" Megalug
15.	24"x24"x8" Conc. Thrust Block P.I.P.
16.	575-LA Conc. Vault

- Use Rowley pipe supports or equivalent as needed (See detail below).
- 2. Pipe support locations to be determined by field personnel.
- All copper pipe that comes in contact with concrete to be wrapped w/10-20 Mil. Scotchwrap corrosion protection tape.
- 4. All mechanical joint fittings are to be megalugged.
- 5. Use deflection fittings (45° Ells.) to achieve necessary depths & cover as shown on the standard specification for the installation of a concrete vault (E-9-12-5).



ARIZONA WATER COMPANY

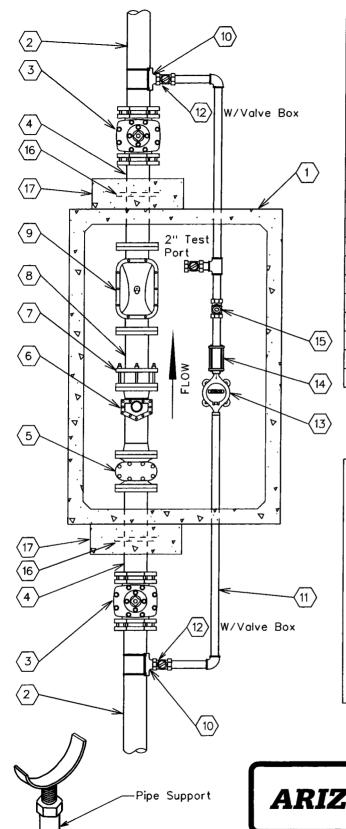
STANDARD SPECIFICATION

FOR THE INSTALLATION OF

6" COMPOUND METER

E-9-12-3

CCO APPROVED BY: MW DATE: 10/5/1993 \(\triangle 08.29.2006 \)



Conc. Block

	· · · · · · · · · · · · · · · · · · ·
No.	FITTINGS SCHEDULE
1.	575-LA Conc. Vault
2.	6" D.I.P.
3.	6" G.V.B.&C. m.j.
4.	6" x 3'-0" D.I.P. SPoolPiece flng x pe
5.	6" Strainer
6.	6" Turbo Meter
7.	6" F.C.A.
8.	6" x 2'-0" D.I.P. Spool Piece flng x pe
L	(TRIM SPOOL PIECE TO 3x THE PIPE DIA.)
9.	6" Detector Check
10.	6"x*N" Tapping Saddle
11.	∗N'' Copper Pipe
12.	×N" Ball Valve (Locking)
13.	×N" Meter
14.	∗N" Coup. Adapt.
15.	∗N" Flapper Check Valve
16.	6" Megalug
17.	24"x24"x8" Conc. Thrust Block P.I.P.

*N - Size To Be determined By A.W.Co.

NOTE:

- 1. Use Rowley pipe supports or equivalent as needed (See detail below).
- 2. Pipe support locations to be determined by field personnel.
- All copper pipe that comes in contact with concrete to be wrapped w/10-20 Mil.
 Scotchwrap corrosion protection tape.
- All mechanical joint fittings are to be megalugged.
- 5. Use deflection fittings (45° Ells.) to achieve necessary depths & cover as shown on the standard specification for the installation of a concrete vault (E-9-12-5).
- 6. To change from a 6" service to a 4" service, change all listed 6" materials to 4" materials.

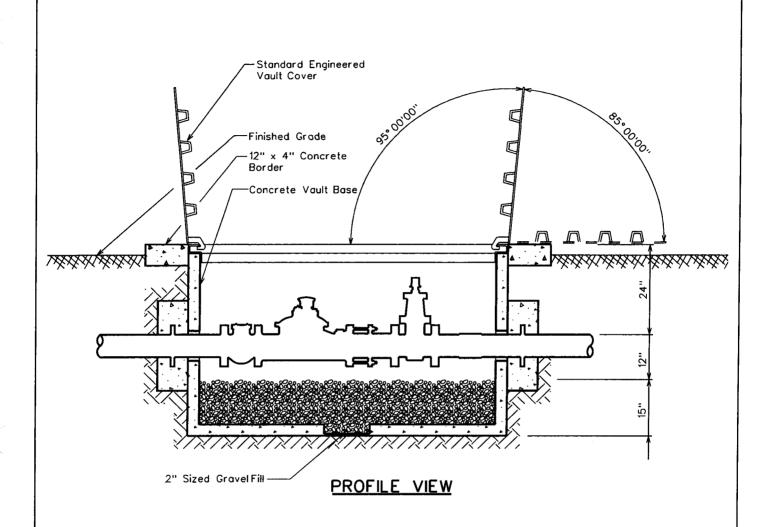
ARIZONA WATER COMPANY

STANDARD SPECIFICATION

FOR THE INSTALLATION OF

6" COMPOUND SERVICE

DRAWN BY: CCO APPROVED BY: MW DATE: 10/05/1993 \(\triangle 08.29.2006 \) E-9-12-4



CONCRETE VAULT & COVER SPECIFICATIONS

Vault - Base No. 575-BL

Cover - Standard Engineered Vault Cover . 4874 Aluminum Diamond Plate Cover For Non-Traffic Loading Areas

Or

. 4874 Galvanized Steel Diamond Plate Cover W/ H-20 Traffic Loading . Double Torsion Spring Assisted Doors W/

Recessed Hasp & Safety Latches

NOTES

- Total Depth Of Concrete Vault To Be A Maximum Of 3'-0" From Top Of Vault Cover To Top Of Gravel Fill.
- Service Connections Larger Than 6" In Diameter Will Conform To The Same Vault & Cover Specifications. Size Of Vault & Cover To Be Determined By A.W.Co. Engineers.

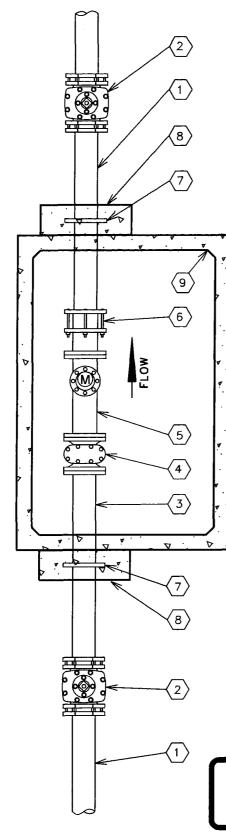
ARIZONA WATER COMPANY

STANDARD SPECIFICATION FOR THE INSTALLATION OF

CONCRETE VAULT

DRAWN BY: CCO APPROVED BY: MW DATE: 10/5/1993

△ 05.17.2001 **E-9-12-5**



No.	FITTINGS SCHEDULE
1.	Ductile Iron Pipe
2.	Gate Valve M.J.
3.	D.I.P. Spool Piece Flg x Pe (10xDia.)
4.	Meter Strainer
5.	Propeller Meter
6.	Flanged Coupling Adapter
7.	Megalug Gland (Thrust Anchor)
8.	Concrete Thrust Block P.I.P.
9.	Concrete Vault

- 1. Use Rowley pipe supports or equivalent as needed (See E-9-12-4).
- 2. Pipe support locations to be determined by field personnel.
- 3. All Sched. 40 Stl. pipe outside of vault to be wrapped w/10-20 Mil. Scotchwrap corrosion protection tape.
- 4. All mechanical joint fittings to are to be megalugged.
- 5. Use deflection fittings (45° Ells.) to achieve necessary depths & cover as shown on the standard specification for the installation of a concrete vault (E-9-12-5).

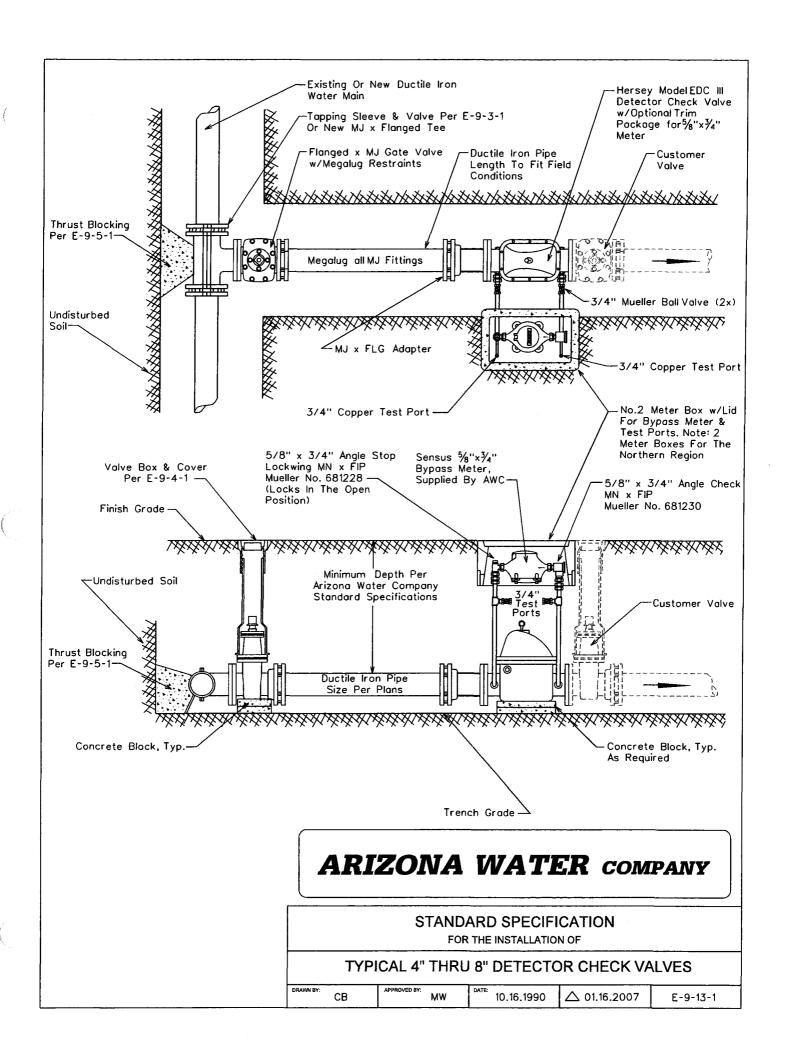
ARIZONA WATER COMPANY

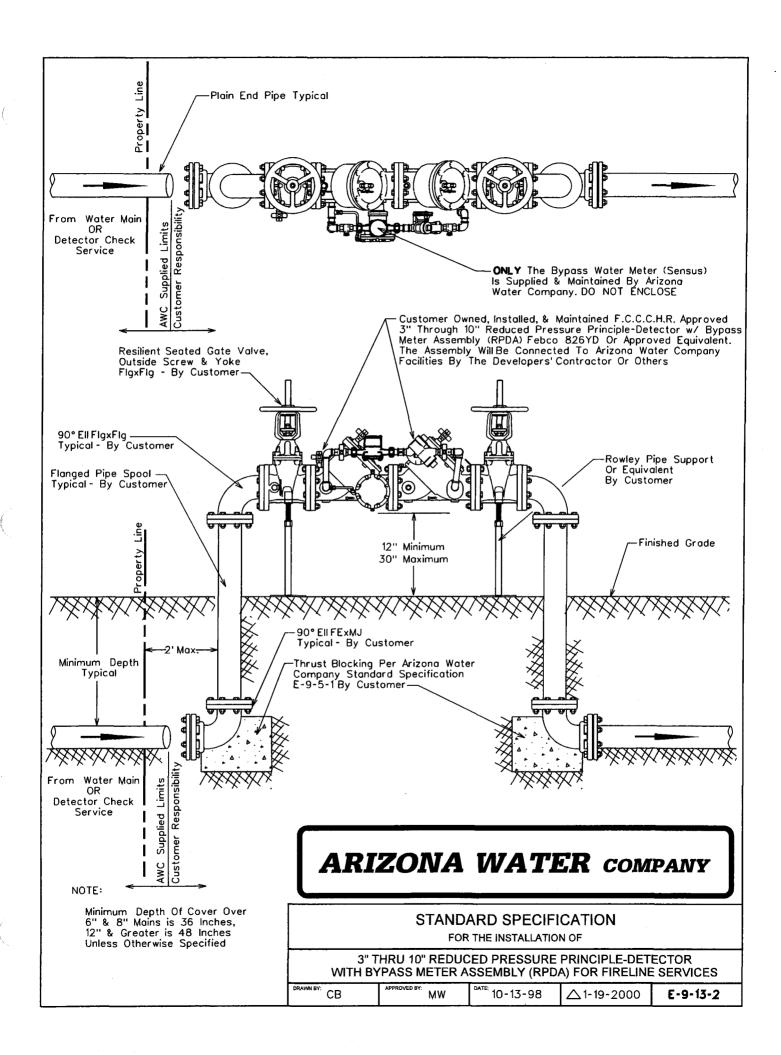
STANDARD SPECIFICATION

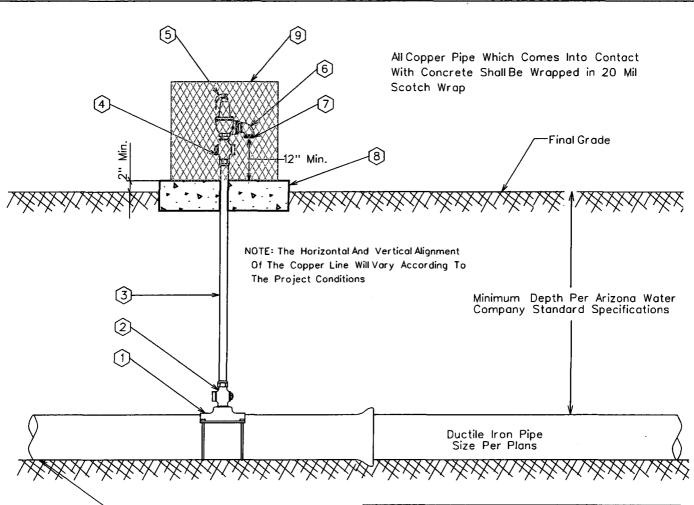
FOR THE INSTALLATION OF

NON-POTABLE PROPELLER METER

DRAWN BY: JPK | APPROVED BY: MW | DATE: 7-20-95 | APPROVED BY: MW | E-9-12-6







 Pressure relief valves are typically located just down stream of a pressure reducing station or where system conditions might be subject to greater than allowable pressures.

-Trench Grade

2. The relief valve assembly and vandalenclosure shall be located out of the roadway, but within the right-of-way or easement.

	<u>FITTINGS SCHEDULE</u>
1.	Mueller BR2B Bronze Service Saddle - Double Strap
2.	2" Mueller B-25008 Taper x Comp. Ball Corp Stop
3.	2" Type 'K' Copper w/NO Splices - Field Fit
4.	2" Mueller B-25028 IP x Comp. Ball Corp Stop
5.	2" Pressure Relief Valve Watts 174A With A 2" Inlet / 2" Outlet 30-150 psi W/ Bronze Body
6.	2" Brass Street Elbow
7.	No.16 Wire Mesh Screen (Non-Corrodible)
8.	4" Thick Concrete Pad - Class 'C' Concrete
9.	Vandal enclosure to be centered on the concrete pad

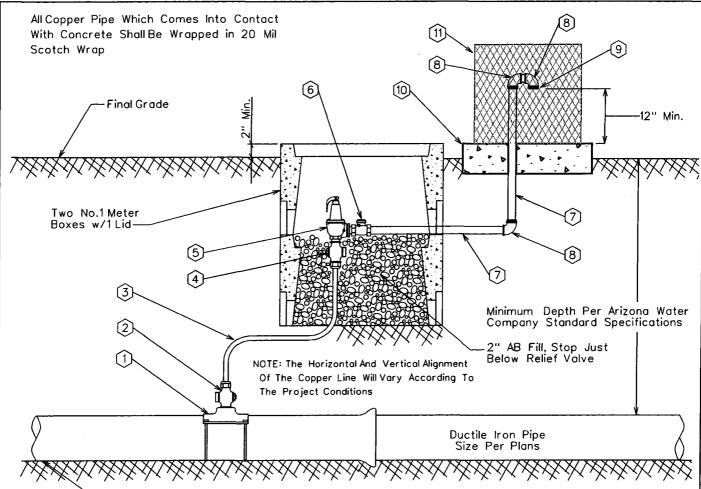
ARIZONA WATER COMPANY

STANDARD SPECIFICATION

FOR THE INSTALLATION OF

TYPICAL PRESSURE RELIEF VALVE ASSEMBLY

DRAWN BY: CCO APPROVED BY: MW DATE: 3/20/1986 △ 08.29.2006 E-9-14-1



-Trench Grade

- 1. Pressure relief valves are typically located just down stream of a pressure reducing station or where system conditions might be subject to greater than allowable pressures.
- 2. The relief valve assembly and vandalenclosure shall be located out of the roadway, but within the right-of-way or easement.

\bigcirc	FITTINGS SCHEDULE
1.	Mueller BR2B Bronze Service Saddle - Double Strap
2.	2" Mueller B-25008 Taper x Comp. Ball Corp Stop
3.	2" Type 'M' Rigid Copper w/NO Splices - Field Fit
4.	2" Mueller B-25028 IP x Comp. Ball Corp Stop
5.	2" Pressure Relief Valve Watts 174A With A 2" Inlet / 2" Outlet 30-150 psi W/ Bronze Body
6.	2" Bronze Check Valve Watts Series CV
7.	2" Schedule 40 Cut Pipe - Field Fit
8.	2" Brass Street Elbow
9.	No.16 Wire Mesh Screen (Non-Corrodible)
10.	4" Thick Concrete Pad - Class 'C' Concrete
11.	Guardshack, Model GS-1, Available From BPDI, Inc. Available In Leaf Green Or Desert Tan

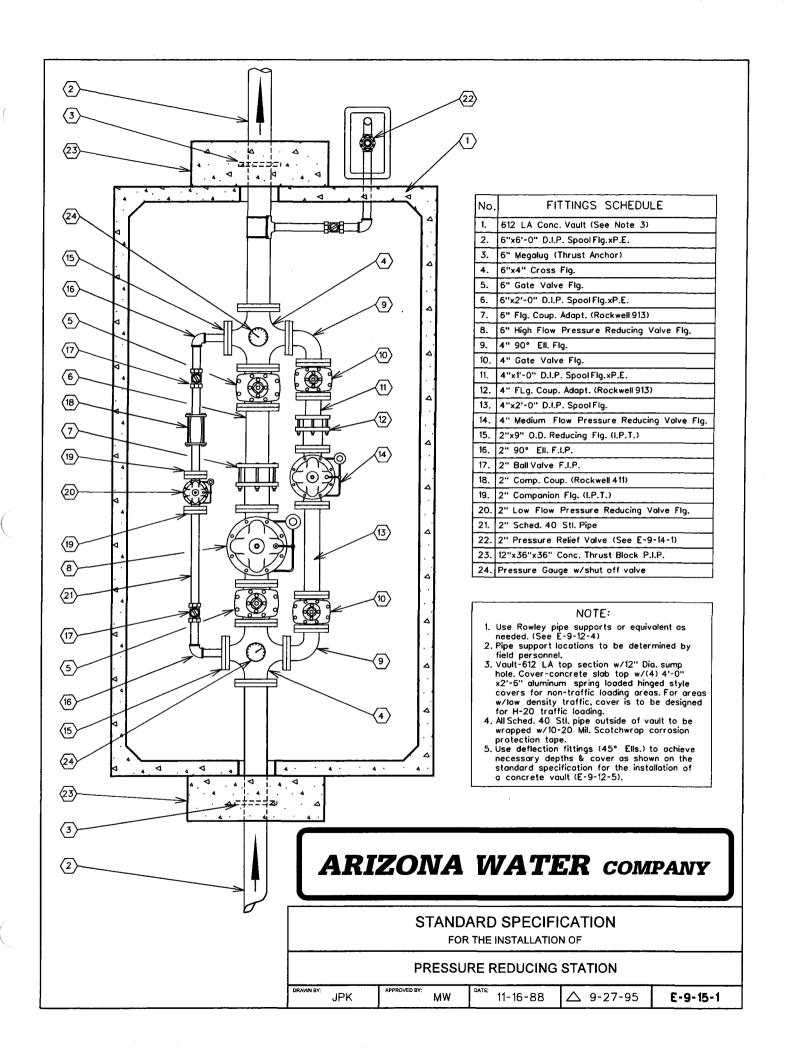
ARIZONA WATER COMPANY

STANDARD SPECIFICATION

FOR THE INSTALLATION OF

PRESSURE RELIEF VALVE - NORTHERN REGION

APPROVED BY: MW DATE 3/20/1986 \(\triangle 08.29.2006 \) E-9-14-2



- 1. Specific Items To Be Painted Deer-O Pure White Enamel:
 - A. All Booster Pumps.
 - B. All Electrical Motors And Gas Engines.
 - C. Well Pump Discharge Heads. D. Electrical Panel.
- 2. Specific Items To Be Painted Frost Cap White Or Deer-O Pure White Enamel:
 - A. Well Shelter.
- 3. Specific Items To Be Painted OSHA Orange:
 - A. Electrical Conduit.
- 4. All Other Items To Be Painted With Either: (At Manager's Discretion)
 - A. Cholla Green
 - B. Forest Green
 - C. Sonora Beige D. Red Rock

 - E. Rock Brown
 F. Deer-O Pure White
 G. Elkhorn Cactus

ARIZONA WATER COMPANY

STANDARD SPECIFICATION FOR THE INSTALLATION OF

PAINT COLOR SELECTION

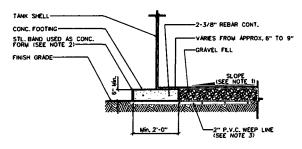
△ 2/13/2001 cco 3/20/1986 E-9-16-1

- 1. Tank shall conform to AWWA Specification 0100-84 with exceptions noted below.
- •2 1/4" minimun shell plate
- 3. Minimum of 12" diameter roof vent, screened with No. 16 non-corrodible wire mesh, to be located on a 24" diameter round hinged manhole opening at the center of the tank to provide access to the dollar plate.
- 4. Overflow pipe shall be the same diameter as the inlet pipe and shall terminate 12 to 24 inches above splash pad or a minimum of 2 overflow pipe diameters above weir box high water level.
- 5. Storage tank shall be placed upon adequately compacted base material.
- 6. 6" minimum floor mounted tank drain outlet to be located close to the outer shell.
- Tank and related fittings shall be enclosed with a 6 foot chain link fence with lockable gates and anti-personnel wire on top of fence.
- B. Liquid level shall be indicated by a target and target board on the outside surface of the tank.
- 9. 24 inch diameter monholes shall be provided on the roof and on the shell near the bottom of the tank. The roof monhole cover shall overlop the manhole by at least 2 inches to provide a rain tight clasure. Roof manhole shall be hinged and equipped with a lock. Shell-monhole cover to be hinged and botted in place. *Tanks larger than a 60 foot diameter require 2 shell-manholes.
- 10. Inside and outside ladders shall be located at the roof markole. Outside ladder shall be caged with lacking trap door. Bottom 8 feet of cage shall be enclosed to within $\frac{1}{2}$ " of shell with 10 gauge sheet steet.
- Finished tank shall be disinfected in accordance with Arizona Department of Health Services Engineering Bulletin No. 8 before being placed into service.
- 12. The following information will be included with application for approval to construct:
 - 1. Tank location
 2. Tank height
 3. Tank diameter
 4. Tank capacity
 5. Method of water level control
- The storage tank will not be constructed within the 100 year flood plain and the tank site will be graded to slope away from the tank.
- The welded steelstorage tank will be coated as per AWWA Specification D102, and N.S.F. Standard 61.

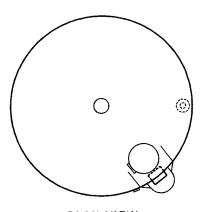
*Exceptions to AWWA Specification D100-84

EDUNDATION NOTES

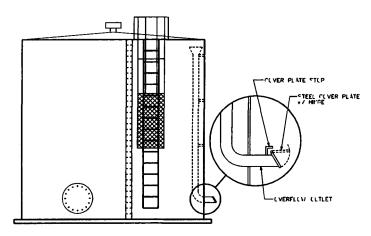
- FINISH CONCRETE SURFACE MUST SLOPE UPWARDS FROM THE STEEL BAND APPROX.
 IN 10'-0".
- 2. TOP OF STEEL BAND MUST BE MAINTAINED LEVEL TO WITHIN 1/6".
- 3. INSTALL 8-2" DIA.*10'-0" P.V.C. WEEP LIMES, EOUALLY SPACED (EVERY 45'), PERFORATE 8'-0" OF LIME WITH 1/2" DIA HOLES @ 6" O.C. PLUG INTERIOR END OF LINE W/2" CAP.



FOUNDATION DETAIL







PROFILE VIEW

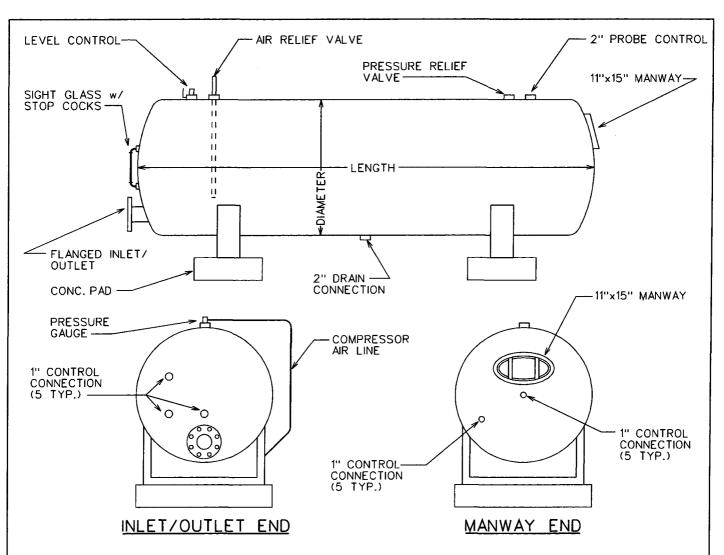
ARIZONA WATER COMPANY

STANDARD SPECIFICATION FOR THE INSTALLATION OF

STEEL WATER STORAGE TANK

DRAWN BY: DATE:

JPK APPROVED BY: MJW 10-17-88 \(\triangle 2-12-96 \) **E-9-17-1**



- 1. ALL HYDROPNEUMATIC TANKS SHALL BE DESIGNED & CONSTRUCTED IN ACCORDANCE WITH THE CURRENT REQUIREMENTS OF THE ASME CODE FOR UNFIRED PRESSURE VESSELS, SECTION VIII, DIVISION 1.
- 2. FINISHED TANK SHALL BE DISINFECTED IN ACCORDANCE WITH ADEQ BULLETIN No. 8 BEFORE BEING PLACED INTO SERVICE.
- 3. THE WELDED STEEL HYDROPNEUMATIC TANK WILL BE COATED AS PER AWWA SPECIFICATION D102 & NSF STANDARD 61.
- 4. THE FOLLOWING INFORMATION WILL BE INCLUDED WITH THE APPLICATION FOR APPROVAL TO CONSTRUCT.
- 1. Tank Location _____
- 2. Tank Length _____
- 3. Tank Diameter _____
- 4. Tank Capacity _____
- 5. Maximum Working Pressure ___

ARIZONA WATER COMPANY

STANDARD SPECIFICATION
FOR THE INSTALLATION OF

HYDROPNEUMATIC TANK

JPK APPROVED BY: MW DATE 3-20-1986 \(\triangle \triangle 01.16.2007 \) E-9-18-1

NOT CONVERTED TO CAD

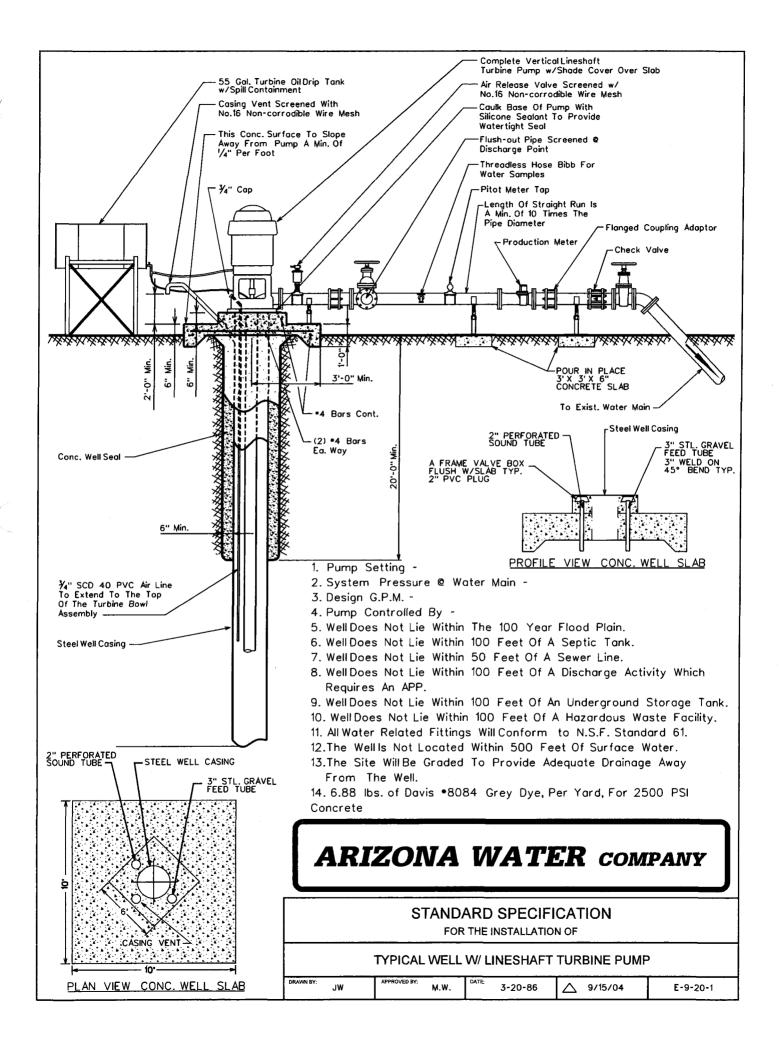
ARIZONA WATER COMPANY

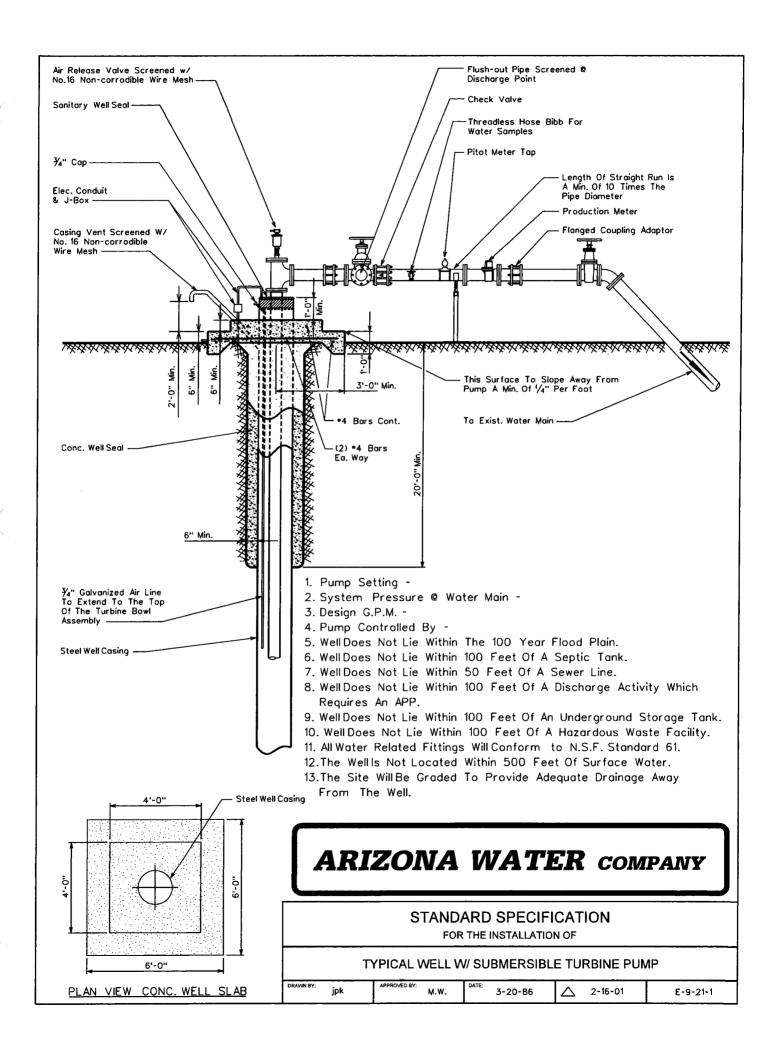
STANDARD SPECIFICATION

FOR THE INSTALLATION OF

WELL SHELTER

DRAWN BY: CB APPROVED BY: DATE: 03.20.1986 △04.03.2001 **E-9-19-1**





All New Purchases To Conform To The Following:

Column Pipe

Oil Tube - Peerless Type

```
1½" O.D. - 14 Threads Per Inch Right Hand
2" O.D. - 12 " " " " "
2½" O.D. - 10 " " " " "
3" O.D. - 10 " " " " "
4" O.D. - 10 " " " " "
```

Line Shaft

```
3/4" O.D. - 10 Threads Per Inch Left Hand
1" O.D. - 14 " " " " "
1-3/16" O.D. - 10 " " " " " "
1-1/2" O.D. - 10 " " " " " "
1-11/16" O.D. - 10 " " " " " "
1-15/16" O.D. - 10 " " " " " "
2-3/16" O.D. - 10 " " " " " " "
2-7/16" O.D. - 8 " " " " " "
```

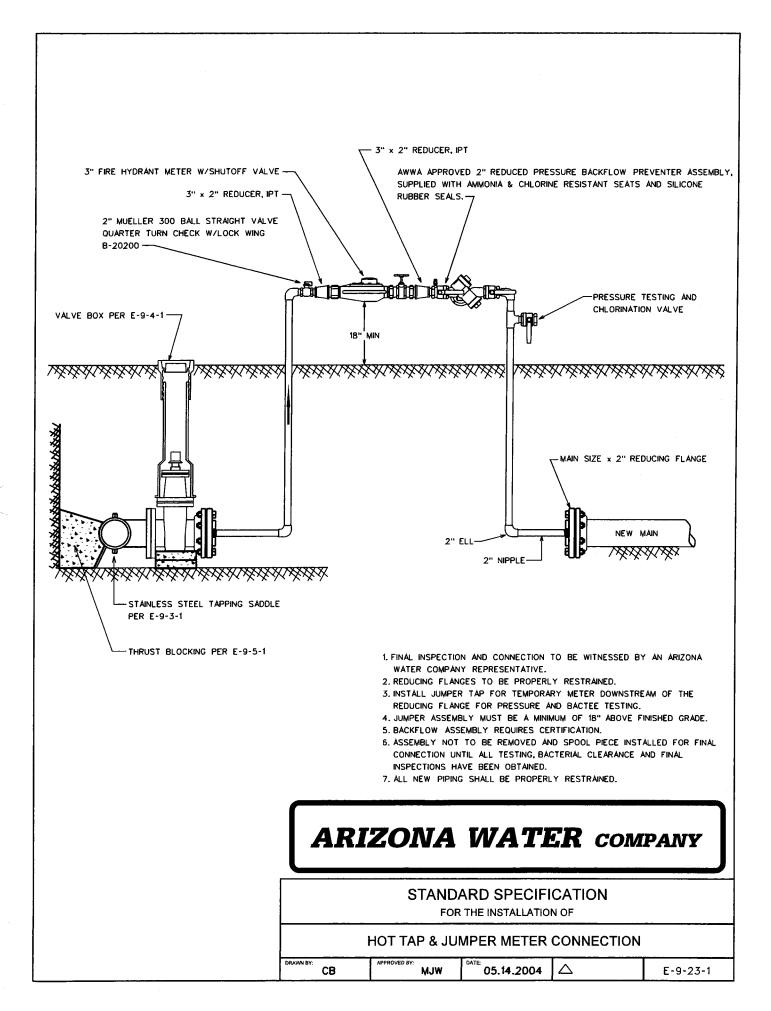
ARIZONA WATER COMPANY

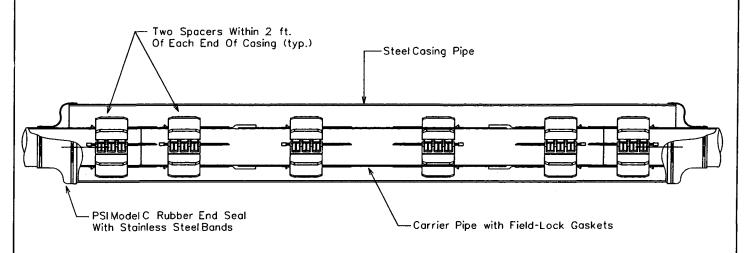
STANDARD SPECIFICATION

FOR THE INSTALLATION OF

COLUMN PIPE, OIL TUBE AND LINE SHAFT

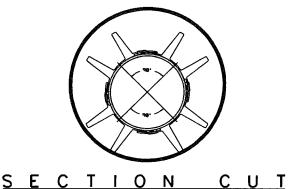
DRAWN BY: CCO APPROVED BY: DATE: 3/20/1996 △ 2/13/2001 **E-9-22-1**





CROSS SECTION

The casing spacers shall be the PSI Ranger II Casing Spacers as manufactured by Pipeline Seal and Insulator, Inc., Houston, Texas.



End Seals

After insertion of the carrier pipe into the casing, the ends of the casing shall be closed by installing 1/8" thick synthetic rubber end seals equal to the PSI Model "C" end seal as manufactured by Pipeline Seal and Insulator, Inc., Houston, Texas.

NOTE: The Carrier Pipe Shall Be Polywrapped Prior To The Skid Installation & Insertion Into The Carrier Casing For Divisions Requiring Polywrapped Pipe.

OD Push On Joint Bell	OD M.J. BELL
6" - 8.66"	6" - 11.12"
8" - 10.82"	8" - 13.37"
12" - 15.05"	12" - 17.94"
16" - 19.74"	16" - 22.56"
20" - 23.98"	20" - 27.08"
24" - 28.16"	24" - 31.58"
30" - 35.40"	30" - 39.12"
36" - 41.84"	36" - 46.00"
48" - 55.94"	48" - 60.00"

*Thickness Of Skid To Extend A Minimum of $\frac{1}{2}$ " Above The O.D. Of The Pipe Bell or Gland.

					_
PIPE SIZE	CASING SIZE	CASING SIZE ID	CASING SCHEDULE	WALL THICKNESS	SKID SIZE
6''	16''	15.25"	STD.	.375	≖x4x12
8''	18''	18.25"	STD.	.375	=x4x12
12"	22"	21.25"	STD.	.375	*x4x12
16"	28"	27.25"	STD.	.375	*x4x12
20"	32"	31.25"	STD.	.375	≖x4x12
24"	36"	35.25"	STD.	.375	•x4x12
30"	48"	47.25"	STD.	.375	≖x4x12
36"	54"	53.25"	STD.	.375	≖x4x12
48"	66"	65.25"	STD.	.375	*x4x12

ARIZONA WATER COMPANY

STANDARD SPECIFICATION

FOR THE INSTALLATION OF

TYPICAL	WATER	LINE EN	ICASEMENT
---------	-------	---------	-----------

DRAWN BY: APPROVED BY: 3/20/1996 △ 09.27.2006 E-9-24-1



SCOPE - This specification describes a ARCH Chemicals Calcium Hypochlorite Tablet Chlorination System as manufactured by ARCH Chemicals, 501 Merritt Seven, P.O. Box 5204, Norwalk, CT, 06856-5204.

DESCRIPTION - The chlorination system shell be completely assembled, ready to install the complete and a ARCH Chemicals Calcium Hypochlorite Tablet install. The chlorination systems hall be a ARCH Chemicals Calcium Hypochlorite Tablet Feeder, and shall be supplied with all its components factory mounted.

ARCH Chemicals Calcium Hypochlorite Tablet Chlorinator

HYPOCHLORINATOR COMPONENTS:

COMPONENTS - The Chlorination system shall have the following components:
A 1-4' ARCH Charterial solid addium hypochlorite tablet feeder
B Polyethylene system enclosure
C, integrated, level controlled solution tank
D Adjustable flow control valve
E Manual an orfor Varve (at inte)
F. Chemical metering pump
G. Onfort brung control solution
H. Waterproof electrical function box
I. Corrotion resistant schedule 40 piping
J. Reverse flow check valves
K. Total solution output control valve

18. Observation Port 19. Mixed Chemical Holding Tank 20. Pressure Relief Valve 21. Pump Speed Control 22. High Level Shut-Off Float Switch 23. Water Spray Nozzles

12. Dry Chemical Hopper
13. Suction Line
14. Electrical Control Box With Power On/Off
15. Electrical Miser
16. Solution Discharge Connection
17. Tank Drain Valve

6. Inlet Shut-Off Valve
T. Inlet Pressure Regulator
B. Inlet Water Pressure Gauge
9. Spray Nozzie Water Pressure
10. Inlet Strainer
11. Inlet Tubing Connection

Chemical Metering Pump
 Pump Suction Connection
 Pump Discharge Connection
 Innet Water Assembly
 Inlet Water Solenoid Valve
 Inlet Water Solenoid Valve

ELECTRICAL FIXTURES - The following electrical fixtures shall be provided:
A. Safety swith: Ly but, tused for 30 Amps, for 120 Volts. 80 cycle, single phase power.

CHLORINATOR DESIGN - The chlorination facility shall be designed and constructed in accordance with Arzone State Operation of the Charles Revision. Order of Video Oyder Oyde

CHLORINATION EQUIPMENT - The chlorination equipment shall be a ARCH Chemicals Calcium Hypochlorite tablet chlorinator, approved by NSF Standard 81.

CHLORINATOR OPERATION - The chlorination facility shall be operated in accordance with Arizona State Department of Health Engineering Bulletin Number 8, "Disinfection of Water Systems," Table 1, latest revision.

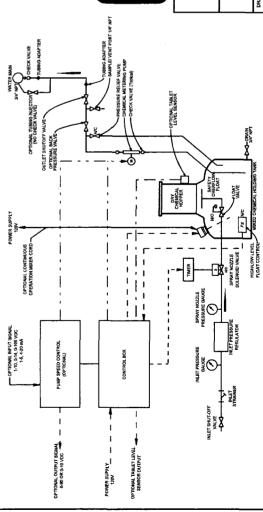
CHLORINATOR SYSTEM DESCRIPTION - ARCH Chemicals tablet chlorinator systems incorporate a patented chlorinator within its designed to builze ARCH Chemicals "1", solid calcium hypochlorine tablets (Approved NST Standard 60), Neets ANWA Standard 60, NEETS 60, NEETS

90 **©** 0 9 FRONT VIEW ☻ **(a)** 働 ➂ ල (2) Θ

(3) P 0 (o 0 0 **(**a) **®** (2) (6)

TOP VIEW HOPPER REMOVED FOR CLARITY

Chlorinator Fluid Schematic

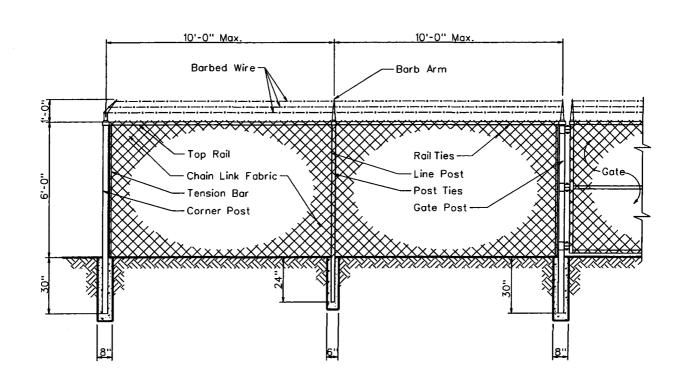


ARIZONA WATER COMPANY

STANDARD SPECIFICATION FOR THE INSTALLATION OF

CALCIUM HYPOCHLORITE TABLET CHLORINATOR

E-9-25-1	
4	
DATE: 02-09-2000	
APPROVED BY: MVV	
DRAWN BY: CB	



 Line Post:
 1-7/8" O.D.
 1.74 lbs. P/L.F.
 ASTM A-256

 End Post:
 2-7/8" O.D.
 4.64 lbs. P/L.F.
 ASTM A-256

 Corner Post:
 2-7/8" O.D.
 4.64 lbs. P/L.F.
 ASTM A-256

 Gate Post:
 2-7/8" O.D.
 4.64 lbs. P/L.F.
 ASTM A-256

Top Roi: 1-5/8" O.D. 4.64 lbs. P/L.F. ASTM A-256

Chain Link Fabric: 9 Ga. 2" Mesh Galv. Before Weave

Selvage: Barb/Knuckle
Fittings: Pressed Steel

Barb Wire: 2-1/2 Ga./2 Point

Barb Arm: 1 Piece/45° Arm

Tension Wire: 9 Ga./Galv.

Line Post Set: 6"x24" In Concrete

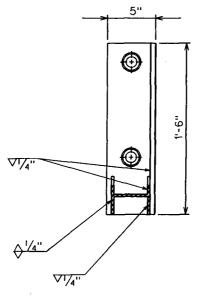
Terminal Post Set: 8"x30" In Concrete

ARIZONA WATER COMPANY

STANDARD SPECIFICATION FOR THE INSTALLATION OF

CHAIN LINK FENCE

DRAWN BY: CCO APPROVED BY: MW DATE: 7/7/1992 △ 2/9/2001 **E-9-26-1**

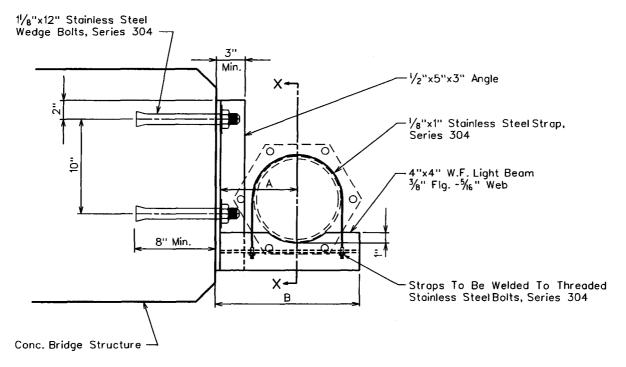


SECTION X-X

NOTES

- Minimum 2 Supports Per Joint Of Pipe.
- 2. All Bolts Shall Have A Lock Washer Under The Nut.
- 3. All Nuts Shall Be Stainless Steel Series 304.

PIPE SIZE	Α	В
8"	8"	15"
10''	9"	17''
12"	10"	19''



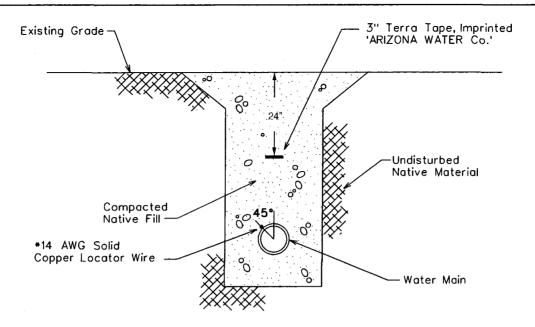
SUSPENSION DETAIL

ARIZONA WATER COMPANY

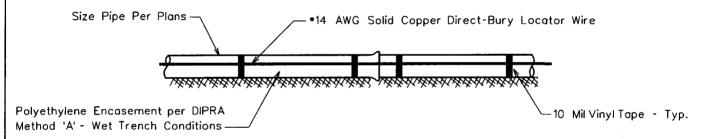
STANDARD SPECIFICATION FOR THE INSTALLATION OF

SIDE HUNG WATER LINE SUSPENSION

DRAWN BY: JPK APPROVED BY: MJW DATE: 7-12-96 \(\triangle \tau \) E-9-27-1



TYPICAL WATER TRENCH DETAIL



TYPICAL PROFILE VIEW

WIRE GENERAL NOTES:

- 1. All pipe shall have *14 AWG Solid Copper
 Direct-Bury Locator Wire Installed Directly To
 The Polywrap At 45° From The Vertical Center
 Of The Pipe and Shall Be Attached Using 10
 Mil Vinyl Tape.
- The Locating Wire Shall Terminate At the Top
 Of Each Valve Box and Be Capable of Extending
 12" Above the Top Of The Box In Such A Manner
 So As Not To Interfere With Valve Operation.

TAPE GENERAL NOTES:

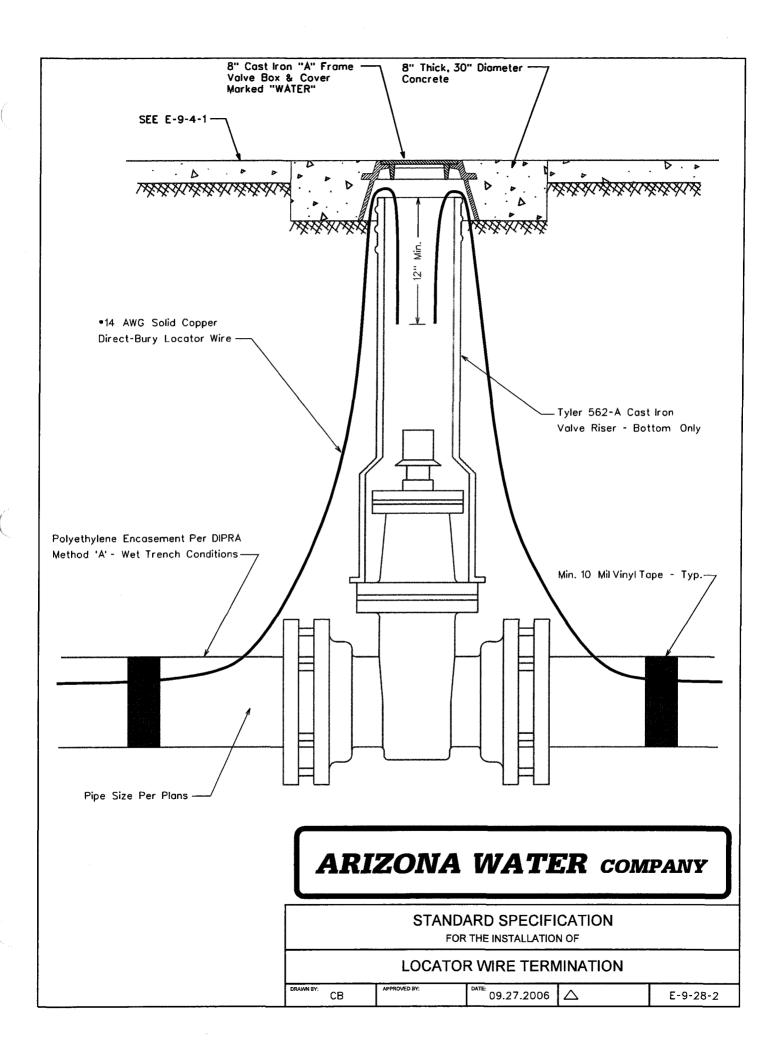
- 1. Use Terra Tape 3" Marking Tape As Manufactured By Reef Industries Inc. Of Houston, Texas (1-800-231-2417)
- 2. The Tape Is Blue & Imprinted 'ARIZONA WATER Co.'
- 3. INSTALLATION: The Pipe Warning Tape Shall Be Installed Over All Water Mains And Shall Be Buried 24 Inches Below The Surface Over The Center Of The Pipe. A) The Backfill Shall Be Sufficiently Leveled So That The Tape Is Installed On A Flat Surface.
- B) The Tape Shall Be Centered In The Trench With The Printed Side Up.
- C) Care Shall Be Exercised To Avoid Movement Of The Tape While The Remaining Backfill Is Moved Into The Trench.

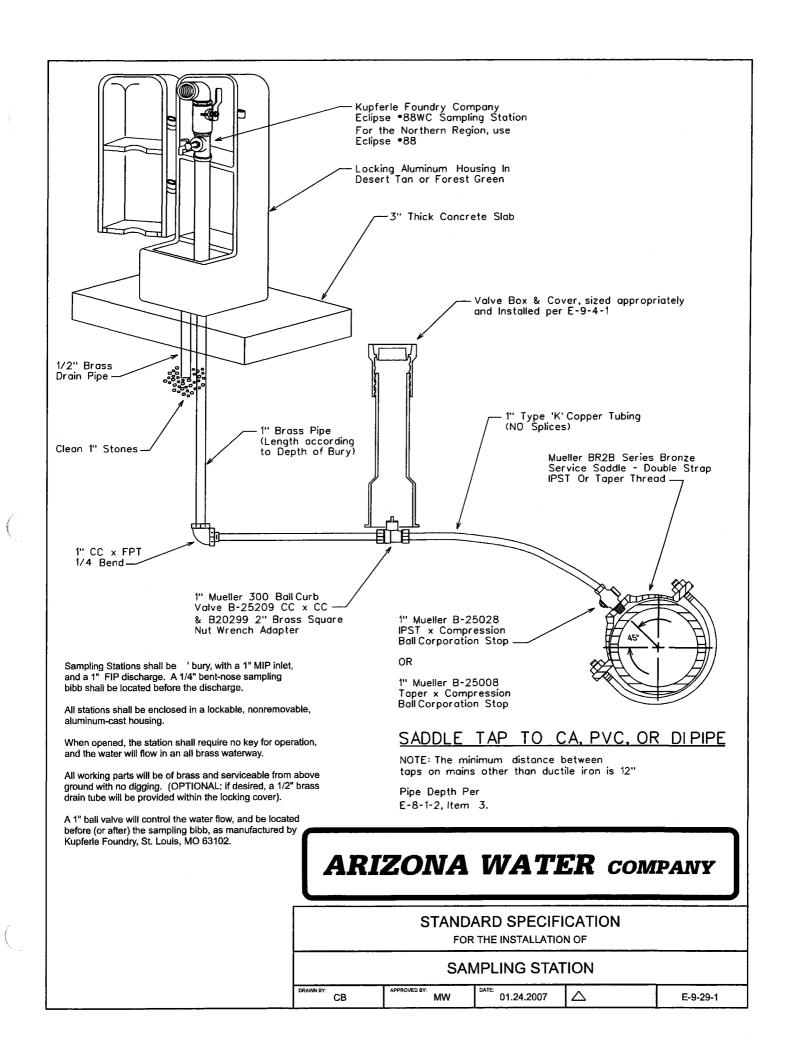
ARIZONA WATER COMPANY

STANDARD SPECIFICATION FOR THE INSTALLATION OF

PIPE WARNING TAPE AND LOCATOR WIRE

DRAWN BY: CB APPROVED BY: 03.24.1997 △09.27.2006 E-9-28-1





TG #3 WOU VIDEO REVIEW VITEO DATE Z/18/11 97771C 136' CLOUPY UNTIL 177 177 HEAVY TUBERCULATION STARTS. WATER BUGINE TO GLUTA. * CLUPA = FLOW = HOTES? VERY GOFT BUILD UP/ BLUFS OFF ON CONTENT \$ RU-VIACE W/ SIDE SCIEN ONLY ? - W/ CIMITED VISABILITY CARINE APPLIANT SOUND - MUTTES TOTALLY PLUMED -FILL @ 380! - BOTTOM OF PUMP 3 340' \$ BAIL TO REDUCTION AT 4966 - PATCH @ 1373 \$116HT BRUSH 177' TO START OF & cura 223' TO DOTTON OF HOLE 3370

MARAD"

& BAIL TO TURNETION @ 496

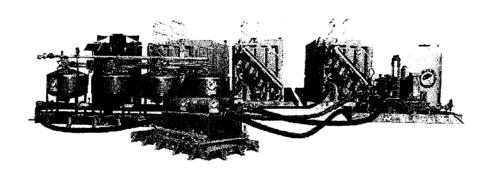
Custom Estimate Developed Especially for:

James Wilson Arizona Water Company 3805 N. Black Canyon P.O. Box Phoenix, AZ 850389006 Phone: 602-294-2177 Ext. 223

Prepared on 2/24/2011 by:

Elton Young
Cell: 602-725-3880
P O Box 11070
Chandler, AZ 85248
Phone: 480-895-9225
Fax: 480-895-0345

www.rainforrent.com



All estimates are Time and Materials unless stated otherwise in the Additional Specifications section of this document.

Rain for Rent Chandler

Rental Estimate

www.rainforrent.com

P O Box 11070 Chandler, AZ 85248 Phone: 480-895-9225 Fax: 480-895-0345

Estimate Number: 10-092-378698

Prepared By: Elton Young

Customer: Arizona Water Company

Customer ID: 920292

Address: 3805 N. Black Canyon P.O. Box

City/State: Phoenix, AZ 850389006

Contact: James Wilson Office: 602-294-2177 Ext. 223

Fax:

Job Description:

Bypass 8" Water line with a temporary 8" HDPE from Kleck Road approximately a mile along Eleven Mile road to Storey road along Storey approximately 3/4 of a mile to discharge point to a 6" Flange supplied by customer in Accordance with customer's IMPROVEMENT PLANS, ATTACHED HERETO AND INCORPORATED HERETO.

Eleven Mile Road from Storey to Kleck down Kleck 3/4 Mile

Casa Grande AZ 85230

Rental Sub Total: \$11,668.20

Sub Total: \$11,668.20

	-	
*The Terms and Conditions of the Rain For Rent Rental and Acute Hazardous Waste Agreements, Credit Application, Invoice, and this estimate contain the complete and final agreement between Rain For Rent and Customer and no other	Est. Delivery Hauling Est. Pick-up Hauling	\$1,004.63° \$1,004.63
agreement in any way modifying or adding to any of said Terms and Conditions will be binding upon Rain For Rent unless made in writing and signed by a Rain For	Est. Pick-up riading	\$1,004.03
Rent Corporate Officer.	Est. Install Labor	\$12,715.00
*Payment terms are net 30 days from invoice date. A 1.5%month late charge will be made on any past due invoices.	Est. Removal Labor	\$9,402.84
*Estimate is valid for 30 days and is subject to credit approval.	Est. Services	\$0.00
*Availability subject to change without notice.		\$0.00
*This is a Time & Material estimate. Customer will be invoiced actual time and equipment usage.	Est. Fuel Surcharge	\$0.00
	tuto — taly management i magent del management del mente que en especial de « competable que de 2007 form t o estable de la competable de la c	WW.XII-XII-XII-XII-XII-XII-XII-XII-XII-XII

(Does Not Include Sales Tax)

Estimate Total:

Valid Until: 3/26/2011

\$35,795.30

Prepared: 2/24/2011

Revision 2

By signing this estimate, customer represents that customer has read and agreed to all terms of this estimate, including those on Terms & Conditions page and those on the Additional Specifications page (if applicable).

- Chistomer's improvement Plans (And Customers Specifications attacked hereto.

Page 2 of 812

Rental Estimate



www.rainforrent.com

P O Box 11070 Chandler, AZ 85248 Phone: 480-895-9225 Fax: 480-895-0345

Estimate Number: 10-092-378698

Application: Water Supply Line Materials: Water Flow: 90 GPM Suction Lift: N/A

*Rain for Rent Cycle = 28 Days.

This estimate has not been flagged as PREVAILING WAGE.

Renta	l Items)	<u> </u>		, , , , , , , , , , , , , , , , , , ,	and the second 		<u></u>
Qty	Unit	Duration	Item	Description	Day	Week	*Cycle	Extension
9240	Feet	1 *Cycle	950945	PIPE-HDPE 8 SDR 17	\$0.00	\$0.00	\$1.18	\$10,903.20
6	Each	1 *Cycle	326098	ADAPT 8 IND-GRV HDPE-SDR17	\$0.00	\$0.00	\$12.00	\$72.00
6	Each	1 *Cycle	722927	ELL-45DEG 8 HDPE-SDR17	\$0.00	\$0.00	\$12.00	. \$72.00
6	Each	1 *Cycle	722928	ELL-90DEG 8 HDPE-SDR17	\$0.00	\$0.00	\$12.00	\$72.00
8	Each	1 *Cycle	722124	SADDLE-TAP HDPE 08x03 FIPT	\$0.00	\$0.00	\$12.00	\$96.00
8	Each	1 *Cycle	721083	VALVE-GATE BRASS 514T10 3	\$0.00	\$0.00	\$9.00	\$72.00
8	Each	1 *Cycle	721071	AIR-VENT AV150 WATERMAN 3	\$0.00	\$0.00	\$9.00	\$72.00
2	Each	1 *Cycle	720665	VALVE-GATE CI FLANGED-10RW 8	\$0.00	\$0.00	\$100.00	\$200.00
4	Each	1 *Cycle	726309	ADAPT 8 FLGXGRV STL	\$0.00	\$0.00	\$12.00	\$48.00
1	Each	1 *Cycle	726318	ADAPT-RED 6x8 FLGXGRV STL	\$0.00	\$0.00	\$12.00	\$12.00
1	Each	1 *Cycle	726312	ADAPT 10 FLGXGRV STL	\$0.00	\$0.00	\$12.00	\$12.00
1	Each	1 *Cycle	727948	RED-IND-GRV 10x8 GAL-STL 10GA	\$0.00	\$0.00	\$12.00	\$12.00
12	Each	1 *Cycle	720768	CPLR-IND-GRV 8 HW STL 77	\$0.00	\$0.00	\$1.75	\$21.00
2	Each	1 *Cycle	720769	CPLR-IND-GRV 10 HW STL 77	\$0.00	\$0.00	\$2.00	\$4.00

Rental Sub Total: \$11,668.20

Sub Total: \$11,668.20

Page 3 of **812**

Rental Estimate



www.rainforrent.com

P O Box 11070 Chandler, AZ 85248 Phone: 480-895-9225 Fax: 480-895-0345

Estimate Number: 10-092-378698

Additional Specifications

BACKGROUND

Arizona Water Company is in need of a temporary water line bypass at its Casa Grande location on Eleven Mile Road and Kleck to be starting point and run along Eleven Mile road to Storey road to discharge point on Storey road. Rain for Rent will be providing the bypass system to Arizona Water. Duration of the project could be from 2 months or more depending on the severity of the project.

SCOPE

Estimate includes new HDPE pipe per customers request.
Rain for Rent will be performing and providing the Delivery. Installation, Hydro testing, Removal and Rental of the pipe, fittings, Fusion Machine, and Forklift needed to complète install system described below. Rain for Rent will start install by attaching to a 10" FLG of customers to a 8" vic from there we will supply a isolation valve and disinfection port and then start fusing along Eleven Mile road. Rain for Rent will supply Air vents as needed along this estimated 1 mile to Storey road at that point we turn and install Customers AL pipe along Storey road and doing the same as along Eleven Mile Road including air vents we will be installing this pipe approximately 3/4 of a mile to a isolation valve and disinfection port at the discharge point being a 6" fig installed and prepared by customer.

- Customer will be responsible for disinfection of pipe and Bacteria testing.

- Customer will be responsible for all trenching and covering of pipe at road Xing's. Rain for rent has included 3 hrs to help install

included 3 hrs to help install

Pipe at each road xings any additional time will be billed on a time and material basis.

PROGRESS/COMPLIANCE

Rain for Rent will comply with the latest fusing procedures outlined by McElroy, ASTM F2620, and performance pipe literature. Upon request by customer, all fuses can be logged and available for review Dailey to ensure that fuses meet acceptable standards. All Rain for Rent personnel will be safety certified to Rain for Rent, MSHA, and OSHA standards.

IN ACCORDANCE WITH CUSTOMER'S IMPROVEMENT PLANS ATTACHED HERETO AND INCORPORATED HEREM.

Page 4 of 812

Rental Estimate



www.rainforrent.com

P O Box 11070 Chandler, AZ 85248 Phone: 480-895-9225 Fax: 480-895-0345

Estimate Number: 10-092-378698 Terms & Conditions

Additional Terms

1. A cycle is defined as 4 weeks. A week is defined as one third of a cycle and a day is one third of a week. Customers will be invoiced at the appropriate cycle, weakly or daily rate based on actual equipment usage except for literation, pipe, hose and fittings which will be billed at the cycle rates only and will not be pro-rated.

2. The rental rate for pumps and equipment with hour maters are based on an 8 hour day or 48 hour running week. The rental rate will be multiplied by 1.5 for greater than 8 hours per day or 49-96 operating hours per week and multiplied by 2.0 for more than 16 hours per day or 96 operating hours per week. Customer will be invoiced for 24 hours per day if the hour meter has stopped functioning.

3. Overtime will be invoiced at 1.5 times the regular rate for work occurring outside of normally achedulad business hours and 2.0 times the regular rate for work occurring on company recognized holidays.

4. Customer will authorize and pay for any changes to work scope including but not limited to schedule changes, material, labor, third party, permit, fee or service costs, it is the Customer's responsibility to cooperate in the timely processing, approval and payment of any charges within Rain For Rent's invoice terms.

PRIVITED THAT ANY MAIN CHARLES HAIST FIRST BE IN WEATING AND GIGNED BY CHARLES. AND RAIN FOR RENT.

5. Customer is responsible to determine the suitability of aquipment for the application,

6. Delivery, Return, installation and Removal costs are estimated. Customer will be invoiced for actual time. Transportation will be invoiced on a Portal to Portal basis.

7. Customer is responsible for flushing and cleaning tanks, roll off boxes, pipelines, pumps, fitters and other Rain for Rent equipment prior to return.

8. Customer is responsible for equipment, repairs, maintenance and damage, excluding normal wear and tear. All returned equipment is subject to inspection by Rain for Rent personnel. Dameges and accrued rent will be invoiced to Customer while equipment is out of service for repairs.

9. The Customer cannot after the equipment without Rain For Rant's prior written approval.

10. Customer will provide "all risk" property insurance for rented equipment.

11. Customer will not allow any equipment to come in contact with any substance that will cause corresion, damage or leakage.

11. Customer will not allow any equipment to come in contact with any substance treat with contact with any substance treat with contact with any contact with any substance treat with contact with any contact w

13. Customer is responsible to obtain any permits, licenses, certificates, bonds and give all notices required by law.

to. The rental period begins the day the equipment is delivered and continues until returned to Rein For Rent's facility unless written confirmation of the release is provided to the Customer before that time.

15. Rental equipment must be returned to the renting Rain for Rent branch unless agreed to in writing before the rental period begins.

16. All metarial that comparin contact with Rain For Rent equipment including media is the responsibility of Customer as generator. Rain For R be responsible for any fines or exactions as a result of Customer's use of the equipment.

17. The equipment is sold "AS IS, WHERE IS" in its present condition. Seller makes no warranties, expressed or implied of any kind whatsoever with respect to the equipment. Buyer agrees that buyer has purchased the equipment based on his judgement end evaluation, without reliance upon any statements of representations of seller, and that seller is not responsible for any defects in its operation or for any repairs, parts or services, unless otherwise noted. 18. De-watering. Roll-off, Vacuum boxes and similar equipment are not liquid tight. Rentee accepts full responsibility for all leases, damages and costs

caused by or arising out of spills, leakage or discharge from this equipment.

t9. Customer will use the equipment in a careful and proper manner and in accordance with safety rulus, industry standards, manufacturer's specifications, recommendations, regulations and applicable laws

20. Customer shall be responsible for environmental fees covering waste fluid, fuel, filter and other disposal costs.

27- A Four Surchargo will be calculated and invoiced based on the clasel fuel price as published by the Department of Energy on http://topto.cia.doo.gov/cog/iafoAvehdp/diosel.gop

22-Customer shall pay Rain For Rent additional exponses caused by site, soil or underground conditions -instuding, but not limited to, rock formation anytronmental conditions, regulations or restrictions, hard pan, boulders, casspools, gas lines, water lines, drain place, underground electrical conduits or

offer above ground or underground obstructions. 23. Customer shall be responsible for acquiring and paying for, if necessary, all public and private property easements required by the project.

24. The estimated fabor component of this quote is based on non-prevailing wage rates. If prevailing wage laws are applicable, Customer must notify Rain For Rent in writing before Rein For Rent estimate completed, if Rain For Rent was not properly notified, Customer shall promptly say any change orders that adjust wages to prevailing wage rates. Customer is responsible for providing applicable prevailing wage rates to Rain for Rent. Rain For Rent will provide certified payrolls on a bi-weekly basis if notified in writing 10 days before the start of the project.

25. Customacis prohibited from deducting returnion from Rein For Runt invoices and charging Rain for Rent liquidated demagns. If 26. Customer is responsible for all routine maintenance including fuel, fluids, arbrication and filters every 150 hours on engine driven equipment. Rain For Rent will charge Customer for servicing any equipment that is on rent or returned that has not been serviced in 150 hours. Rain For Rent can provide field service upon request for an additional service charge. Rain For Rent must be notified 2 business days in edvance to echedule required field service. service upon request for an additional service charge. Rain For Rent must be nounced a suscense days an additional costs to Rain For Rent associated with Owner Controlled Insurance (OCIP) or WRAP insurance programs that will be a susceptible of the controlled Insurance (OCIP) or WRAP insurance programs that will be a susceptible of the controlled Insurance (OCIP) or WRAP insurance programs that will be a susceptible or which is a

he added to Rain For Rents prises

28. Customer is responsible to provide freeze protection for all equipment on site.

29. This estimate excludes any costs associated with ARRA (American Recovery and Reinvestment Act) reporting requirements that may be flowed down

Page Selfiz PAK Printed 3/23/2011 4:27 PM se 10-022-379696 Confidentially Notice: This custation and any established document(s) are privileged and conditional, and are inflanded for the soft use of the addresses(s). They cannot be used, see displaced, quoted or otherwise research to or disclosed to fairly perfect for any readon without the written consent of an Critical of Wessen Defects Supply Company displaces from the case of the statement of the control of th

to Rain For Rent.

- 30. Customer will be responsible for security, traffic control and road crossings. Traffic control shall meet all applicable Federal, State, and Municipal laws and regulations to assure a safe work environment.
- 31. Cold Weather Packages for tanks consist of up to 4 tank heaters and a submersible pump which is designed for use in a non-combustible or corrosive environment.
- 32. Tank heaters are operated on 120 volts, 12.5 amps each or 50 amps total. The submersible pump operates at 120 volts, 10 amps.
- 33. Customer is responsible for electrical connections and compliance with applicable permits, regulations and code requirements.
- 34. Tank Cold Weather Packages are not to be used in combustible or corrosive environments.
- 35. Tank Cold Weather Packages are a preventative measure that may keep fluids inside the tank from freezing. RFR will not guarantee fluids from freezing and any resulting damages.

Job Specific Terms

- 36. Rain for Rent will not be responsible for chlorination or bacteria testing of pumps and piping supplied for potable water applications.
- 37. Rain for Rent will supply disinfection ports at both ends of the pipeline for convenience.
- 38. It is recommended that an independent party or vendor be secured to perform both the disinfection and bacteria testing. Rain for Rent does not warranty the water quality. Customer is responsible for confirming that water is fit for its intended use and associated with its use.
- 39. Aluminum piping should not be subjected to more than 75ppm of chlorine or sodium hydroxide when sanitizing.
- 40. Steel piping should not be subjected to more than 300ppm of chlorine or sodium hydroxide when sanitizing.
- 41. Rain for Rent recommends that the customer coordinate with their local water agency to ascertain water quality testing protocol.
- 42. Renter/contractor will supply all safety equipment and supply pipeline protection devices such as "k-rail traffic control" etc.
- 43. Contractor should note phone numbers below for any service or repair need to reduce any unreasonable service interruptions.
- 44. Rain for Rent recommends and has included in this estimate a hydrostatic pipeline test. The test pressure should not exceed the maximum working pressure of pipe and components.
- 45. Rain for Rent will install isolation valves at each end of the pipeline.
- 46. Contractor/renter shall be responsible for any pipe anchoring or thrust blocking.
- 47. Contractor shall supply names and phone numbers of job superintendent or job site contact.
- 48. Customer will be responsible for security, traffic control and road crossings. Traffic control shall meet all applicable Federal, State, and Municipal laws and regulations to assure a safe work environment.

49. Customer shall hold harmless, indemnify and defend Rain For Rent from any claims whatsoever, arising from or related to (A) any pollution, contamination, environmental impairment and/or similar condition directly or indirectly caused by or resulting in whole or in part from Customer's use of any Equipment or (B) any environmental statutory or regulatory compliance requirements applicable to any equipment (or any use thereof) and required under any and all foreign or domestic federal, state or local laws,ordinances, regulations, codes, or requirements of any governmental authorities which regulate or impose standards of liability or conduct concerning air, water, soils, wetlands and watercourses, solid waste, hazardous waste and/or materials, worker and community right-to-know, noise, resource protection, health protection and similar environmental, health, safety, and land use concerns as may now or at any time hereafter be in effect. This indemnification shall survive the termination of the agreement.

17 18

50. LABOR AND/OR MATERIAL RELEASES

The Contractor shall supply labor and/or material releases satisfactory to the Company when requested to do so. Forms will be provided by the Company.

51. LICENSE

The Contractor shall have, as may be required by law, a valid license applicable to the work to be performed.

52. INSURANCE

The Contractor shall maintain in full force and effect insurance at no less than the following minimum amounts:

WORKER'S COMPENSATION	In accordance with requirements of the laws of the State of Arizona.
COMPREHENSIVE GENERAL LIABILITY (Including contractual liability covering death, bodily injury and property damage)	Combined single limit of not less than \$1,000,000 for each occurrence.
AUTOMOTIVE LIABILITY (Including owned, non-owned and hired vehicles)	Combined single limit of not less than \$1,000,000 for each occurrence.
SUBCONTRACTOR'S PUBLIC LIABILITY AND PROPERTY DAMAGE INSURANCE AND VEHICLE LIABILITY INSURANCE	Contractor shall either require each of its subcontractors to procure and to maintain Subcontractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance of the type and in the amounts specified in this Section 5 or insure the activities of its subcontractors in Contractor's own policy, in like amounts.

Such insurance shall name the Company, its officers, agents, and employees as additional insured and be primary for all purposes.

The Company will at all times have the right to require that all of such insurance be placed with insurance companies that are satisfactory to it. The Contractor shall file with the Company a certificate evidencing that each policy of insurance for the above coverages in the minimum amounts specified has been purchased and is in good standing.

Such certificate shall provide that notice be given to the Company at least thirty (30) days prior to cancellation or material change in the form of such policies or any of them. Such certificates shall be kept on file by the Company and the Company must have current certificates on file, or a certificate must accompany any bid proposal, before that proposal will be accepted by the Company.

04/01/04 MW:MRF E-4-1-7



CONTRACTOR UNDERSTANDS WORK AND WORKING CONDITIONS 53.

By executing a Contract with the Company, the Contractor warrants that it has, by careful examination, satisfied itself as to the nature and location of the work, including soil conditions, the character, quality and quantity of the materials to be encountered, the character of the equipment and facilities needed preliminary to and during prosecution of the work, the general and local conditions, and all other matters which can in any way be expected to affect its work under the Contract. Verbal agreements or conversations with any officer, agent or employee of the Company, either before or after the execution of the Contract, are not binding upon the Company and shall not affect or modify any of the terms or obligations herein contained.

SPECIFICATIONS AND DRAWINGS 54.

The Contractor shall keep on the job a complete copy of all drawings and specifications furnished by the Company which are applicable to the Contract with the Company. Anything mentioned in the specifications and not shown on the drawings or shown on the drawings and not mentioned in the specifications shall be of like effect as if shown or mentioned in both. In case of a discrepancy between the figures, drawings or specifications and physical conditions of the job, the matter shall be immediately submitted to the Company's Authorized Representative for decision as to adjustments, if any, because of the discrepancy; without a decision from the Company's Authorized Representative no discrepancy shall be adjusted by the Contractor, save only at its own risk and expense. Any deviation from the specifications must be approved in writing by the Company's Authorized Representative.

INDEPENDENT CONTRACTOR 55

The Contractor is an independent contractor and any provisions in the Contract, the specifications, or these General Conditions of Contract and Arizona Water Company's Construction Specifications which may appear to give the Company the right to direct the Contractor as to the details of the doing of any work to be performed by the Contractor, or to exercise a measure of control over said work, shall be deemed to mean and shall mean, that the Contractor shall follow the desires of the Company in the results of the work only and not in the means whereby said work is to be accomplished, and the Contractor shall use its own discretion and shall have complete and authoritative control over the work and as to the details of the doing of the work.

56. LAWS, REGULATIONS

Contractor shall give all notices required by law and comply with all laws, ordinances, rules and regulations, including, but not limited to, all applicable federal, state, local and other legally required health and safety standards, orders, rules, regulations or other laws, pertaining to the conduct of the work. Contractor shall be liable for, and shall defend and indemnify Company against and hold it harmless from, all violations of any law, ordinance, rule, regulation, standard, or order in connection with work furnished by or on behalf of Contractor. If Contractor observes that the Contract Documents are at variance with any law, ordinance, rule, regulation, standard, or order it shall promptly notify Company in writing and any necessary changes shall be adjusted as provided in the Contract for changes in the work. Contractor shall not perform any work contrary to such laws ordinances, rules, regulations, standards, or orders.





57. PROCEDURE OF WORK (PIPELINE ONLY)

All work under the Contract shall be planned and performed so as to cause a minimum of interference with normal vehicular and pedestrian traffic. At no time shall the Contractor completely obstruct the traffic to any business establishment during normal work hours of that business. It shall be the Contractor's responsibility to maintain facilities for ingress and egress to any business establishment. When crossing any street, not more than one-half of the street may be blocked at one time. All federal, state, county and city laws, rules and regulations relating to this subject are to be obeyed.

The Contractor shall complete any portion or portions of the work in such order of time as the Company may require. The Company shall have the right to take possession of and use any completed or partially completed portions of the work. If such prior possession or use increases the cost of or delays the work, the Contractor will be entitled to extra compensation or extension of time or both, as the Company may determine.

58. DISPUTES

All questions or controversies which arise between the Contractor and the Company, under, or in reference to, the Contract, shall be decided by the Company's Authorized Representative and a representative of the Contractor, and their decision shall be final and conclusive upon both parties.

59. CONNECTION TO EXISTING SYSTEM (PIPELINE ONLY)

Unless approved in writing by the Company's Authorized Representative, no tie-in or hot tap on the existing system shall be made unless the Company's Inspector is present. When the tie-in requires the operation of an existing valve or other control equipment, the conditions of Paragraph(s) 30 and 33 shall be complied with. The Contractor shall notify the Company twenty-four (24) hours prior to tie-in as to the exact time the Contractor plans to make tie-in so that the Company's Inspector will have sufficient time to locate valves and make necessary preliminary arrangements for shut down.

60. PLANNED INTERRUPTION OF WATER SERVICE (PIPELINE ONLY)

No valve or other control on an existing Company water system shall be operated for any purpose by the Contractor without approval of the Company's Inspector. All of the Company's water customers whose service is interrupted by a planned interruption, other than in cases of emergency, shall be notified by the Contractor at least twenty-four (24) hours before the planned interruption and advised of the probable time when the service will be restored.

61. EXISTING UTILITY FACILITIES (PIPELINE ONLY)

The Contractor shall notify all known utilities in the area of the work to be performed under the Contract and shall make arrangements to have their facilities marked in accordance with A.R.S. 40-360.022 ("Blue Stake Law"). The Contractor shall be responsible for locating and preserving all marked facilities. Any damages to these marked facilities shall be repaired at the expense of the Contractor.

The Company will pay the cost to relocate its or other structures when such structures are found occupying the physical space of the proposed installation. It is understood that

(*

the Contractor will be reimbursed for such work only when written authorization from the Company has been obtained in advance of such work.

62. CLEANING UP

The Contractor shall remove from the Company's property and from all public and private property, at its own expense, all temporary structures, rubbish and waste materials resulting from its operations. In the event Contractor fails to do so, the Company may remove same at the expense of the Contractor.

63. WORKING HOURS (PIPELINE ONLY)

Unless stated to the contrary in the Invitation to Bid and/or so stated on the Construction Drawings, or agreed to by the Company during a Pre-Construction Conference, the Contractor shall not be permitted to perform work on Saturdays, Sundays, or Company holidays, or commence work such as tie-ins that cannot be completed during normal working hours.

64. INDEMNITY

- The Contractor shall indemnify the Company against, and save and hold it harmless from, any and all liability, claims, demands, loss, actions, causes of action, expense, penalties, fines, assessments, damages and costs of every kind and nature for injury to or death of any and all persons, including, without limitation, employees or representatives of the Company or of the Contractor or of any subcontractor, or any other person or persons, and for damage, destruction or loss, consequential or otherwise, to or of any and all property, real or personal, including, without limitation, property of the Company or of the Contractor or of any subcontractor, or of any other person or persons, and the violation of any law, ordinance, rule, regulation, standard, or order resulting from or in any manner arising out of or in connection with the performance of the work under the Contract, but only to the extent caused by Contractor. The Contractor shall also, upon request by the Company, and at no expense to the Company, defend the Company in any and all suits, concerning such injury to or death of any and all persons, and concerning such damage, destruction or loss, consequential or otherwise, to or of any and all property, real or personal, including, without limitation, suits by employees or representatives of the Company or of the Contractor or of any subcontractor, or any other person or persons, or concerning any court or administrative proceeding concerning the violation of any law, ordinance, rule, regulation, standard, or order. Excluded from this paragraph are only those injuries to or deaths of persons and damage, destruction or loss, to or of property arising from the negligence or willful misconduct of the Company.
- B. Contractor shall indemnify the Company against, and save and hold it harmless from, any and all liability, claims, demands, damages, costs, expenses and attorney's fees, suffered or incurred on account of any breach of any obligation, covenant or other provision of this contract, including without limitation, breach of the indemnity provisions of subsection A of this Section 37.
- C. Contractor further agrees to defend, indemnify and hold harmless the Company, its directors, officers, employees, and agents, from and against any and all costs, damages, claims, expenses, violations, notices of violations, penalties, liens, assessments, and liabilities of every kind and nature, foreseeable or unforeseeable, directly or indirectly, arising from any release, removal, generation, use, storage or disposal on, under,

04/01/04 MW:MRF E-4-1-10 around, or from the well site of any material, substance, or waste, hazardous or non-hazardous, including, without limitation, drilling fluids, mud, cuttings and development and test water, but only to the extent caused by Contractor.

65. LIENS

If at any time there shall be evidence of any lien or claim for which the Company might become liable and which is chargeable to the Contractor, the Company shall have the right to retain out of any payment then due or thereafter to become due, an amount sufficient to completely indemnify the Company against such lien or claim. If the Company determines that such lien or claim is valid, the Company may pay and discharge the same, and deduct the amount so paid from any monies which may be or become due and payable to the Contractor.

66. PAYMENT

Upon completion of the installation or construction, the Company will, within thirty (30) days after receipt of proper invoice and labor and material releases, pay the amount due the Contractor. If the Company believes that additional work, such as clean up, is required, it may deduct the total cost of such additional work from the amount to be paid to Contractor.

67. COMPANY'S RIGHT TO TERMINATE CONTRACT: DAMAGES DUE TO DELAY

If the Company finds the Contractor to be in material violation of any section of these General Conditions of Contract, Construction Specifications or Standard Specification Drawings or if the Contractor refuses or fails to prosecute the work, or any separable part thereof, with such diligence as will insure its completion within the time specified or any extension thereof, or fails to complete said work within such time, or when any other cause exists to justify such action, the Company may, without prejudice to any other right or remedy, by written notice to the Contractor, terminate its right to proceed with the work or such part of the work as to which there has been such violation, delay or other cause.

In the event the Contractor's right to proceed is terminated, the Company may take over the work and prosecute said work to completion by whatever method it may deem expedient. The Contractor and its sureties shall be liable to the Company for any excess cost caused thereby.

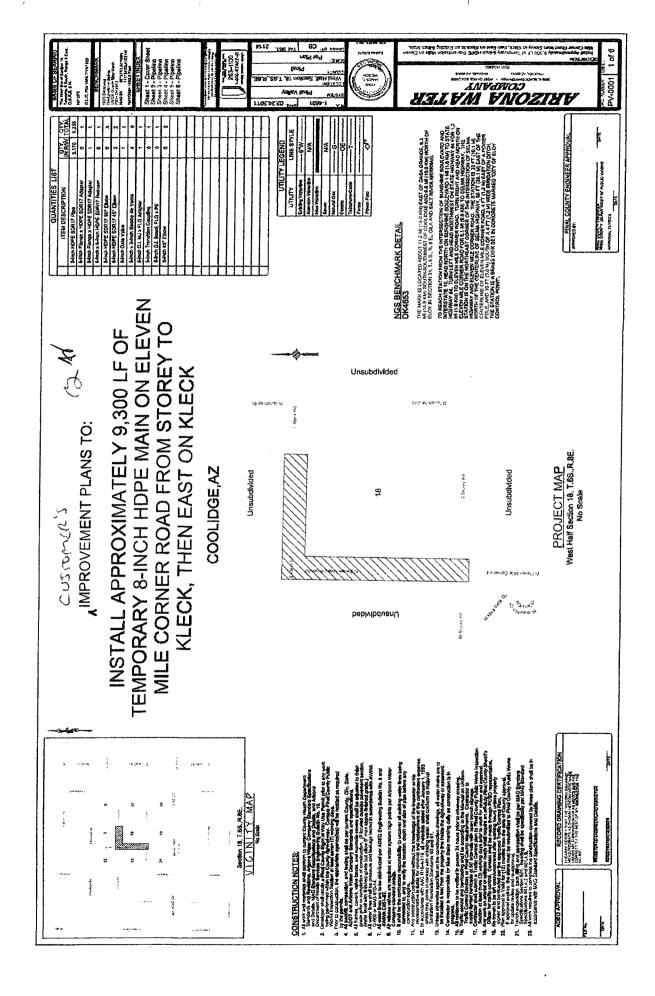
In the event the Contractor's right to proceed with the work is terminated, the Contractor shall not be entitled to receive any further payment until the work is completed or the job is canceled. If the unpaid balance of the Contract price exceeds the expense of finishing the work, including compensation for additional managerial and administrative services, such excess shall be paid to the Contractor. If such expenses exceed such unpaid balance, the Contractor shall pay the difference to the Company.

04/01/04 MW:MRF E-4-1-11

DEFINITIONS

- A. Company/Customer. The words "Company" or "Arizona Water Company" mean Arizona Water Company, and where applicable, any division of Arizona Water Company, whose principal place of business is located at 3805 North Black Canyon Highway, Phoenix. Arizona 85015-5351 (Post Office Box 29006, Phoenix, Arizona 85038-9006).
- B. Company's Authorized Representative. The words "Company's Authorized Representative" mean any officer of the Company, and any of the Company's Engineers, any Division Manager or Superintendent of the Company and/or such other person(s) designated in writing as the "Company's Authorized Representative" by the President or any Vice President of the Company.
- C. Contractor/Rain for Rent. The word "Contractor" means either an individual or other entity employed to do the work as shown on the Construction Drawings and as specified herein.
- D. Construction Drawings. The words "Construction Drawings" mean plans prepared by or on behalf of Arizona Water Company.
- E. Invitation to Bid. The term "Invitation to Bid" means the current copy of Arizona Water Company's Form E-3-11-4 Request for Proposal/Contract or Form E-3-12-2 Invitation to Bid.
- F. Contract. The word "Contract" means the written document titled "Contract" or "Proposal/Contract" when such document has been signed by an officer or other authorized representative of both the Contractor and the Company.
- G. Inspector, The word "Inspector" means the Company's Authorized Representative or a person designated in writing by the Company's Authorized Representative.

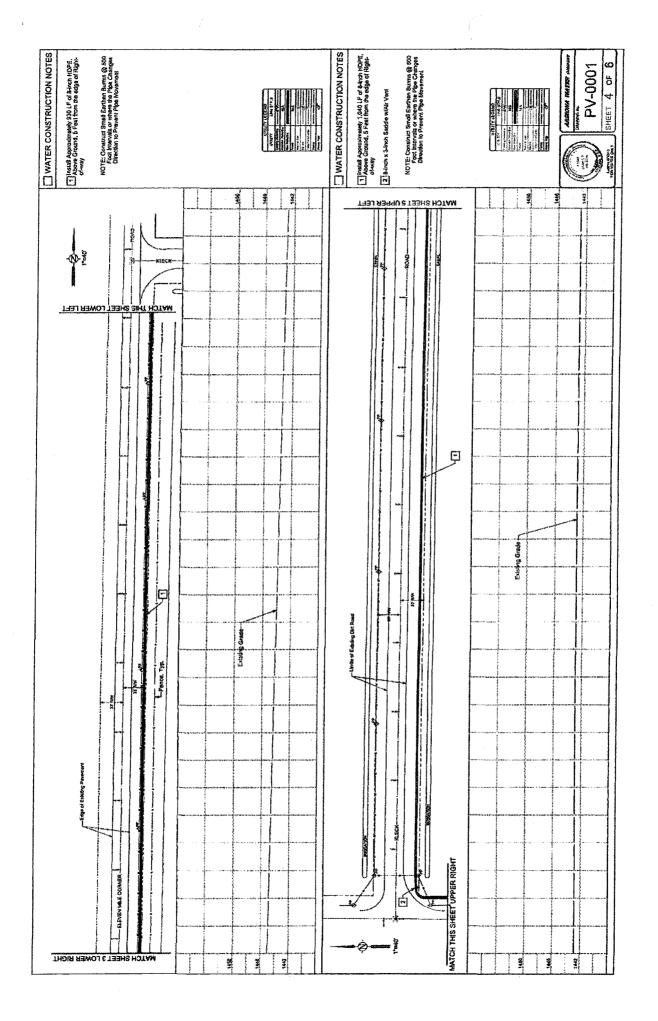
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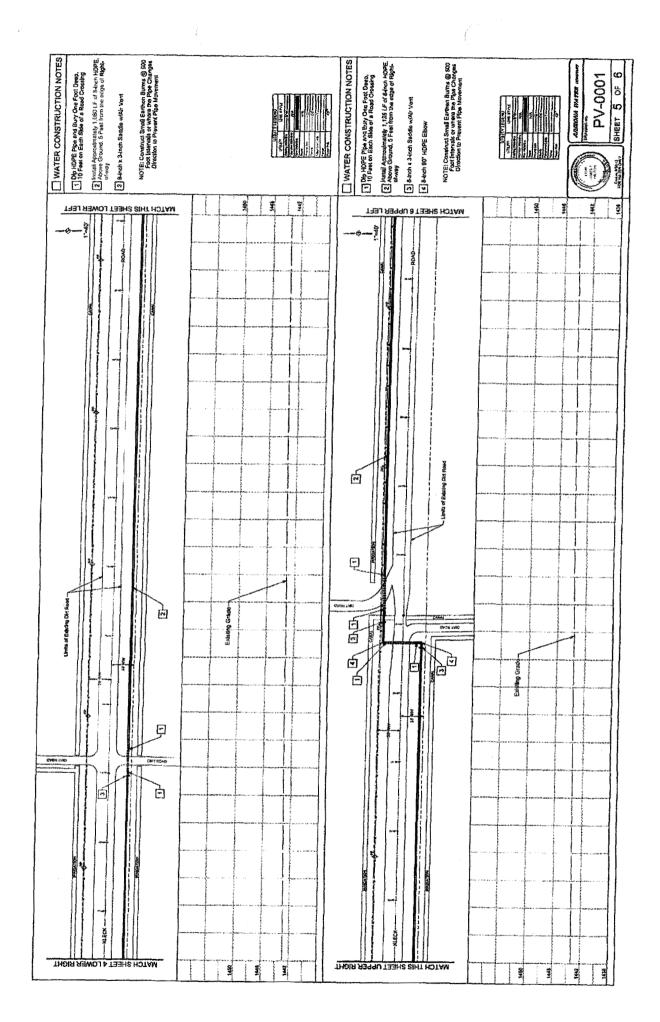


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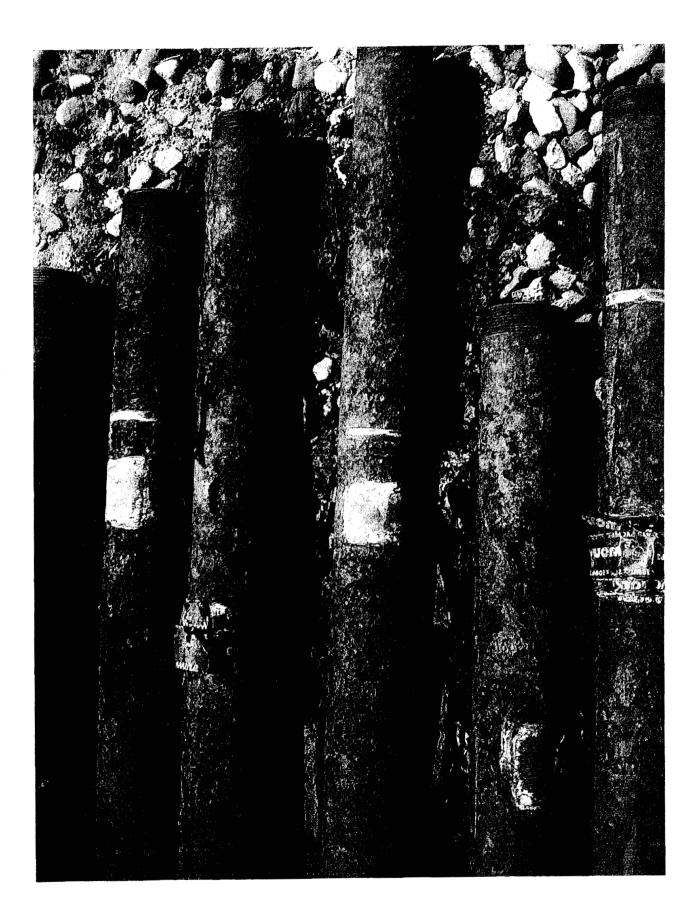




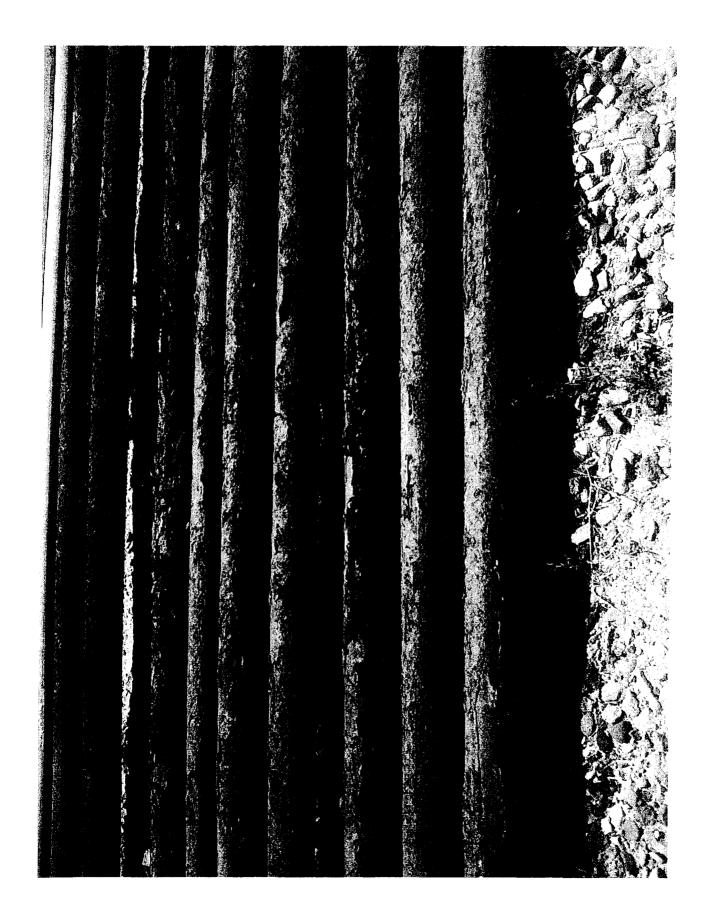












ARIZONA WATER COMPANY WORK AUTHORIZATION

WA 1-481

V.A. NUMBER:

DE. NUMBER:

UDGET IT WAND

HEET NO.:

			SHEET NO.:	1 of 2
SYSTEM:	WHITE TANK			
DIVISION:	PINAL VALLEY	WORK TO START BY:	UPON AUTHORIZATION	
TAX CODE:	7900	WORK TO BE FINISHED BY:	WITHIN 60 DAYS	

DESCRIPTION OF WORK:

Install six vertical relocations along Jackrabbit Trail (195th Ave.) to accommodate Maricopa Count Flood Control District improvements to the White Tank FRS No. 3 Outfall Channel. Construct in accordance with attached drawings and/or Arizona Water Company specifications.

FACTORS JUSTIFYING WORK:

These waterlines are located within Maricopa County Right of Way and were installed by permit. The relocations are required to accommodate Maricopa County ROW improvements and are being performed at the Company's expense per the terms of the ROW permit 2011 Approved Budget Item (\$65,000)

COST ESTIMA	TE		AUTHO	DATE	
COST OF WORK:			PREPARED BY:	1 /oe whole	3.28.11
MATERIAL		0	Joe Whelan	<u> </u>	4-21-11
LABOR		7,000	REVIEWED FOR ESMT	OW VERIFICATION:	03-28-2011
CONTRACT PORTION		93,634	Charles Briggs	£B 04-21-2011	-
OVERHEAD		15,095	REVIEWED BY:		-1-11
TOTAL AUTHORIZED EXPENDITURES CHARGEABLE TO THIS W.A.	\$	115,729	James Wilson	ilizh ne	3/ 69/11
FUNDS RECEIVED:	1		APPROVED BY ENGINEE	RING:	
CONTRIBUTIONS RECEIVED		0	Fredrick Schnei		3-31-11
REFUNDABLE ADVANCES RECEIVED		0	APPROVED BY FINANCE		duly
TOTAL CONTRIBUTIONS/ADVANCES		ø	Joseph Harris	<i></i>	71111
NET CASH REQUIRED	\$	115,729	AUTHORIZED BY PRESID	ENT:	1.7-2611
COMMENTS:			William Garfield	Lengald	4-5-201
			CONSTRUCTION RELEAS	SE:	

FILE COPY

The additional \$50,729 required to complete this project will be allocated as follows: \$40,000 will be re-allocated from WA# 1-4809, which will be cancelled. The remaining \$10,729 will come out of Contingency Fund.

RELEASED TO CONSTRUCTION

Authorized by FRED SCHNEIDER
Date 4/20/20/1

AFH

ARIZONA WATE COMPANY

OMPANY

WORK AUTHORIZATION - DETAIL SHEET

W.A. NUMBER:
P.E. NUMBER:
BUDGET ITEM NO.:
SHEET NO.:

1-4810 1-4810

			STILL	NO.	4 01 4
	PLANT PROPERTY ACCOUNT	UNIT DESCRIPTION	QUANTITY	YEAR INSTALLED AND W.A. NUMBER	
RETIREMENT	343	6" CA Pipe	120 LF	1971 2-2583	
	343	6" DIP Pipe	80 LF	2007 1-3771	
PROPERTY	343	8" DIP Pipe	60 LF	1998 2-2530	
UNITS	343	12" DIP Pipe	100 LF	2002 2-3310	
[343	8" CA Pipe	120 LF	1977 2-7101	

Install six vertical relocations along Jackrabbit Trail (195th Ave.) to accommodate Maricopa Count Flood Control District improvements to the White Tank FRS No. 3 Outfall Channel.

'	inprovements to the white rank PRS No. 3 Outland	линов.					
	DESCRIPTION	PLANT PROP ACCT	QUANTITY		UNIT COST		TOTAL
	Install 6" Vertical Realignments with all related fittings	343	305	\$	78.25	\$	23,866
	Install 8" Vertical Realignments with all related fittings	343	180		86.33		15,539
С	Install 12" Vertical Realignments with all related fittings	343	100		192.00		19,200
o	Contracting Tax	343	1		3,208.91		3,209
N	Performance and Payment Bond	343	1		2,727.23		2,727
T	Install air relief valve	343	6		1,715.00		10,290
A	Install a 12" x 6" T.S.V.B.&C.	343	1		3,740.00		3,740
С	Install a 6" tee w/ 2 - 6" valves and a 6" MJ Adapter	343	1		5,540.00		5,540
Т	Install a 2" blowoff device	343	1		1,905.00		1,905
w	Install a 6" cap	343	1	<u> </u>	888.00		888
0	Slurry per MCDOT requirement on Camelback Road	343	30	 	87.00		2,610
R	Cut in an 8" valve just north of Meadowbrook	343	1		4,120.00		4,120
K	SERVICE CONNECTIONS COMPLETE: DOUBLE-LONG	345			.,,,	-	.,
	SERVICE CONNECTIONS COMPLETE: DOUBLE-SHORT	345					
	SERVICE CONNECTIONS COMPLETE: SINGLE-LONG	345					
	SERVICE CONNECTIONS COMPLETE: SINGLE-EDNO	345					
TOI	TAL CONTRACT WORK	0.10				\$	93,634
	AL CONTRACT WORK					*	33,004
							
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R	SERVICE CONNECTIONS: DOUBLE-LONG	345					
A	SERVICE CONNECTIONS: DOUBLE-SHORT	345					
L	SERVICE CONNECTIONS: SINGLE-LONG	345					
S	SERVICE CONNECTIONS: SINGLE-SHORT	345					
	METERS	346					
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L	TESTING FEE	343	1	\$	500.00	-	500
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	STOTAL - CONTRACT WORK, MATERIALS, AND LABOR					\$	100,634
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TOT	AL REFUNDABLE PORTION	NON-REFUNDABLE PORTION		cos	T ESTIMATE	3	115,729

Board of Directors

Fulton Brock, District 1
Don Stapely, District 2
Andrew Kunasek, District 3
Max Wilson, District 4
Mary Rose Wilcox, District 5

www.fcd.maricopa.gov

2801 West Durango Street Phoenix, Arizona 85009 Phone: 602-506-1501 Fax: 602-506-4601 TT: 602-505-5897

December 16, 2010

Arizona Water Company Attn: Mr. Joe Whelan 2805 West Black Canyon Highway Phoenix, AZ 85015

RE: White Tanks FRS #3 Outfall Channel FCD Project Number - 470.04.32

Dear Mr. Whelan:

The Flood Control District (FCD) is proceeding with the development of plans for the construction of flood control facilities for the above mentioned project. FCD's goal is to have all utility conflicts that require relocation completed no later than the end of February 2011 when construction of the project will be advertised for bidding. The exception to this would be any relocation work that Arizona Water may have performed by FCD's contractor on Arizona Water's behalf in which case the work will coincide with the project construction schedule. Arizona Water has not produced prior rights documentation in this area and therefore, all costs will be paid for by Arizona Water.

This letter will serve as a request to have your facilities relocated no later than February 28, 2011. Any work that extends past this date and causes FCD's contractor project delays will cause the Flood Control District to seek full reimbursement of those costs from the Arizona Water Company.

Thank you for your continued cooperation on this project and please feel free to contact either Project Manager Gary Wesch at 602-506-4592 or Utility Coordinator Gary Maiers at 602-506-0562 if you have any questions.

Sincerely,

Donald R. Rerick

PPM Division Manager

Joe Whelan

From:

Gary Maiers - FCDX [gsm@mail.maricopa.gov]

Sent:

Monday, December 20, 2010 11:54 AM

To:

Joe Whelan

Cc:

Gary Wesch - FCDX; Scott Vogel - FCDX

Subject:

White Tanks III - Arizona Water Company Relocations

Thank you for the additional information concerning your water line relocations. We understand the need to obtain the appropriate Health Department and MCDOT permits and will try and assist you if you run into problems. I was not aware that a letter had been sent to Hoskin-Ryan with details of Arizona Water Company's requirement of 120 days from receipt of a letter of authorization to complete your relocations. I would ask that you please forward a copy of that letter to me for my file as well.



Concerning prior rights, nothing has been submitted to the District indicating the Arizona Water Company had any claim to prior rights so the District will expect Arizona Water Company to fund any relocation necessary to remove conflicts with the project. If the relocations are covered by an easement, PUE, or other legal documentation please submit that information at your earliest convenience for consideration.

Regarding potentially using the District's contractor for relocations, the draw back to that process is that we won't know who our contractor is going to be until the bids are open in February. Once our contractor has been selected, we will provide you with their contact information and it will be up to Arizona Water Company to contract directly with the contractor you choose to utilize for your relocations. We anticipate that your relocations will be complete by April 16, 2011 per your 120 day schedule. Meeting this schedule will require timely construction contracting and relocation efforts by the Arizona Water Company.

Please let me know if you have any questions or require additional information to assist you with your relocations.

Gary S. Maicrs

Utility Coordinator - FCDMC

(602) 506-0562 - Office (602) 525-3439 - Cell

gsm@mail.maricopa.gov

BOUND PIPE

MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION APPLICATION AND PERMIT

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PHONE 506-8609 FOR INSPECTION
24 HOURS IN ADVANCE
ARRANGEMENTS FOR ROAD OBSTRUCTION OR
CLOSURES MUST BE MADE 24 HOURS IN ADVANCE

TRANSPORTATION DIRECTOR

By Lead Vocano 12/29/92



CONDITIONS

- 1. That the Licensee assumes the responsibility and all liability for any injury or damage to said highway, or to any person while, using said highway, caused by or arising out of the exercise of this permit or license.
- 2 That all work done shall be at the sole cost and expense of the Licensee and shall be done at such time and in such a manner as to be least inconvenient to the traveling public, and as directed by the agent of the Licensor Work must be finished in the time specified on permit.
- That when the proposed work is completed the Licensee shall repair the roadbed and replace the surfacing material thereon and will leave the said road in as good a condition as it is now, so far as the road is affected by the Licensee.
- 4. If the subject of the permit or license fails to pass final inspection, the Licensee will remove or replace the same within such time as specified by written notice from the Licensor; or if at any time hereafter; any material used by the Licensee in replacing or reconstructing any part of said highway proves defective, the Licensee will replace the same with the kind and quality of material which the Licensor shall specify.
- 5. That-if the title and possession of any property placed upon the right-of way by the Licensee remains in said Licensee, the Licensee shall and will promptly perform all necessary repair work upon written notice from the Licensor, and will not permit or allow any condition to exist which would be a hazard or source of danger to the traveling public.
- 6. That if at any time hereafter the right of way or any portion thereof, occupied and used by the Licensee may be needed or required by the Licenser, any permit of license granted in pursuance of this application, may be revoked by the Licenser and all right thereunder terminated, and upon sufficient notice, the Licensee, shall and will remove all property belonging to said Licensee.
- 7. That in the event that the work to be done under the authority of the permit or license necessitates the creation of any hazard or source of danger to any person or vehicle using said highway, said Licensee shall and will provide and maintain at all times during the existence of said hazard sufficient barriers, hanger signals, lanterns, detours, and shall and will take such other measures of precaution as the Licenson shall direct.
- 8. That if the work to be undertaken is of such a nature or character that the Licensor deems thecessary that said work be laid out or inspected by the Licensor, said Licensee will defray any and all expenses incurred by said Licensor, and herein agrees to reimburse the Licensor, and for that purpose will deposit with the Licensor à surp of money in the amount necessary to cover all cost incurred by the Licensor.
- 9. That in the event any property belonging to or the area occupied by such property being used by the Licensee within any portion of the right-of-way interferes within is needed to construct, maintain, reconstruct, improve, or relocate any highway, street, road, drainage, or sewer lines, or structures pertaining thereto, by or for the Licensor, said Licensee shall at his own expense, remove, lower, or raise such property, within a reasonable time, when requested to do so by the Licensor in writing.
- 10. All conditions of this permit shall be in conformity with the latest Maricopa County Board of Supervisor's Permit Resolution, including but not limited to the following:
 - a. Cash or a performance bond of a sum equal to not less than one half of the amount of the cost of the work must be deposited with the County Engineer's office as a guarantee that the work will be completed in accordance with the permit and the County's details and specifications.
 - b. A certificate of insurance shall be filed with the office of the County Engineer covering Public Liability and Property.

 Damage with the following minimum limits:

\$500,000 — Bodily Injury, per person, per occurrence.
\$1,000,000 — Bodily Injury, more than one person, per occurrence.
\$500,000 — Property Damge, per occurrence.

在2010年前是4月1日的1日的1日的1日日

It is the sole responsibility of the Licensee to maintain coverage in force for the term of the permit and to name the County as an additional insured. Said coverage shall be primary and failure to conform to the above requirements shall not waive any responsibility of the Licensee.

Fifteen day written notice of change or cancellation of the policy shall be served on the County Engineer.

 A copy of the schedule of fees is on file in the Maricopa County Highway Department and the Office of the Board of Supervisors.

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Permit Application

NO. H 09094

For Construction In County Right of Way

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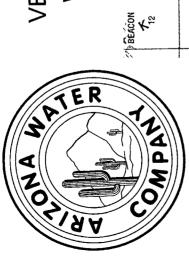
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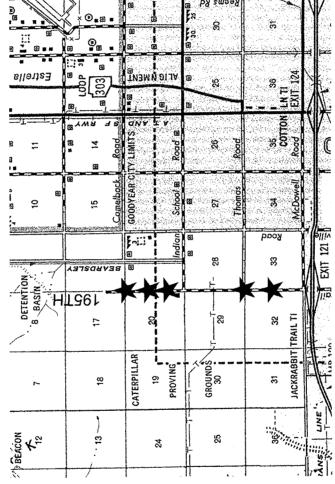
MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION APPLICATION AND PERMIT FOR CONSTRUCTION IN COUNTY RIGHT-OF-WAY

No.L 29383

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VERTICAL REALIGNMENTS FOR THE WHITE TANK OUTFALL CHANNEL





MARICOPA COUNTY ENVIRONMENTAL SERVICES DEPARTMENT

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JARICOPA COUNTY DEPARTMENT OF TRANSPORTATION (MCDOT) SEMERAL NOTES (MCDOT RIGHT-OF-WAY)

- ALL WORK SHALL CONFORM TO THE MOST CURRENT UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION. PUBLICS HAS USED THE WORKS CONSTRUCTION. PUBLICS HAS USED THE WORKS THE WORK THE REQUEST SHALL SHA
- THE ENGINEERING DESIGNS ON THESE PLANS ARE ONLY APPROVED BY MCDOT IN CONCEPT AND NOT THE DEVINE CONTRICTION OLD MAINTIES DATH ARE NOT VEHERE DAMS ARE NOT VEHERELE BY MCDOT APPROVIA, OF THESE PLANS ARE DEVELORED THESE PLANS ARE DEVELOR OF PERMIT PURPOSES ONLY AND SHALL NOT PREVENT MCDOT FROM FEDURING CONFECTION OF ERRORS IN THE PLANS WHERE SUCH ERRORS ARE SUBSCICENTLY FOUND TO BE IN YOLATION OF ARY LIMI, ORDINANCE, HEALTH, SAFETY, MCDOT ROADMAY DESIGN MANUAL, OR OTHER DESIGN ISSUES.
- AN APPROVED SET OF PLANS SHALL BE ON THE SITE DURING CONSTRUCTION AND AVALABLE TO MCDOT AND OTHER IMPECTORS.
 - BOX CLLVERTS SHALL BE IN ACCORDANCE WITH STRUCTURAL DESIGN DETALS IN THIS PLAN SET IF ALTERNITIES ARE ALLOMBLE, THEY SHALL COMPLY WITH ARIZONA DESIGN SECRETATION (ADOI) LATEST DESIGN SPECIFICATIONS AND STANDARDS. MINIMUM CLEAR HEIGHT OF BOX CLLVERT SHALL BE SHOWN.
- CONTRACTOR TO GBTAIN NECESSARY MODOT PERWITS PRIOR TO CONSTRUCTION WITHIN ROAD RIGHT-GE-MAY ALL NECESSARY PERMITS FROM LOCAL GOVERNMENTS FOR WORK WITHIN THEIR LIMISDICTION.
- CONTRACTOR PERFORMINE CONSTRUCTON OF EXCAVATING OPERATIONS IS RESPONSIBLE FOR LOCATING ALL UNITARES IN CONFLICT OR MITHIN THE CLEAR XONE THE CONTRACTOR SHALL CONTRACT ** SLAFE STARES IN CONFLICT TO REIGINAING CONSTRUCTION. CONTRACTOR SHALL NOTIFY THE MCDOT INSPECTION DEPT.AT LEAST 24 HOURS IN ADVANCE OF ANY CONSTRUCTOR AT (802) 506-8608.
- THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ANY RECUIRED PERMITS FOR EARTH MOVING FROM MARCOPA, COUNTY AIR COLUMY DEPARTMENTS DUST CONSULANCE DIVISIONS (1623) BEFOR PRIOR TO COMDUCTING EXCANATION OPERATIONS, A CORY OF THE PERMIT AND DUST CONTROL PLAN SHALL BE SUBMITTED TO THE COUNTY ENGINEER PRIOR TO COMMEMBER TO THE COUNTY ENGINEER PRIOR TO COMMEMBER TO FAIV EARTHMOVING ACTIVITIES.
 - THE FLOOD CONTROL DISTRICT IS RESPONSIBLE FOR OBTAINING 404 PERMIT.
- EXCEPT UNDER EMERGENCY COMDITIONS, ROADS SHALL NOT BE CLOSED FOR CONSTRUCTION ACTIVITY UNLESS PROMA APPROVAL IS GETAINED FROM THE MCDOT TRANSPORTATION DIRECTION OR HIS REPRESENTATIVE.
- PRIOR TO MOVING OR DESTROYING PROTECTED NATIVE PLANT SPECIES,THE CONTRACTOR SHALL FILE A FORMA. NOTICE OF MITENT WITH THE ARIZONA DEPARTMENT OF ASRICULTURE NATIVE PLANTS (602) 842-640.
 - PRIOR TO INSTALLATION OF CURB.GUTTER, SIDEMAIA, BASE COURSE. AND WEARING SURFACE SUBUIT SOIL TESTION SOIL SOURCESTOR OF REVIEW AND APPROVILE, FOR SUBCE GADE. STRAILATION IS RESOURCED. THE AREA STRAILATION IS RESOURCED. THE AREA STRAILATE SHALL BE FOR BUTCH SOF SUBJECT TO BACK OF SIDEMALK AND WATCH THE STABLIZATION DEPTH OF THE PAYEMENT BACK STRAILATION.
 - ASPHALT MIX DESIGN SHALL BE SUBMITTED TO MODOT A MINIMUM OF 48 HOURS PRIOR TO PLACING ANY ASPHALT COURSES THEORIN WOSE EKLÜLDEDIN LA PAHED THRHOUTS SHALL IMAIC THE SAME ASPHALT AND BASE REQUIREMENTS AS THE ADJACENT ROLANMY UNLESS MODED DITHEMISE.
- ALL COMPACTION AND BACKFILL WITHIN COUNTY RIGHT-OF-WAY SHALL CONFORM TO THE WCDOT SUPPLEMENT TO MAG SPECIFICATIONS BACKFILL UNDER EXISTING PAYEMENT CURB AND GUTTER OR WITHIN TWO FEET (2) OR LESS FROM THE EDGE OF PAYEMENT SHALL CONSIST OF ONE-HALF (1/2) SACK CASH.
- ALL STRUCTURES, SUCH AS MANNOLES, VALVE BOX & COVERS, AND MUNICHMEN WELLS MUST BE MANKED WITH AT LESS TWO REFLECTOR FELLOW KELP POSTS WHEN STRUCTURES. AME LOCATED OUTSIDE THE TRAVELED WAY AND WITHIN THE RIGHT-OF-MAY, (APPLIES ONLY WHEN THERE IS NO CUMB.)
- ANY SAW CUT ALONG EXISTING ROADMAY EDGE WHICH REMOVES THE EDGE OF THE ROADMAY SHALL BE A WIMMUM OF 2.FEET FROM THE EDGE OF THE EDISTINCE MAY BE GREATER. BLASED ON PANEMENT CONDITIONS OR ROADMAY ELEVATIONS BUT SHALL NOT BE LOCATED WITHIN A LANE WHEEL PATH, AND IF REEDED SHALL BE IN HALF LAWE INCREMENTS.
 - ALL EXISTING PAYEMENT MARKING,TRAFFIC SIGNS AND SIGNAL EQUIPMENT THAT NEEDS TO BE THE GRONDED/REPLACED
 - PAVENENT WARKING, SIGNING AND SIGNAL WORK WILL BE INSPECTED AND SHALL MEET COUNTY STANDARDS BEFORE RELEASE OF BOND.
- ID. THE CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS WITHIN THE RIGHT-OF-WAY TO A CONDITION EQUAL TO OR BETTER THAN EXISTING IMPROFEIGRET FOR MAG 1073. DISPOSAL OF ALL WASTE WATERAL WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.

SENERAL NOTES

- I. ALL CONSTRUCTION TO BE PERFORMED ACCORDING TO APPLICABLE MAG STANDARD DETAILS AND THROUGH 2009 ND THE TOWN OF BUCKEYE.
- 3. EXISTING UTILITIES AND OTHER FACULTIES HAVE BEEN PLACED ON THE PLANS FROM FIELD SUPPLYE, EASTSING WAYS AND OTHER CURRENT PLANS WITHIN THE AREA OF THIS PROJECT. THE CONTRACTOR WILL DETERMINE THE EXACT COLATION AND OF ELEVATION OF ENSIRING UTILITIES WHICH PERTAIN TO AND AFFECT THE CONTRACTOR OF THIS PROJECT. 2. FACILITIES WHICH ARE NOT SPECIFICALLY LOCATED WITH ACTUAL HORIZONTAL AND VERTICAL CONTROLS ARE APPROXIMATE AND TO THE BEST AVAILABLE INFORMATION.
- TWO (2) WORKING DAYS PRIOR TO EXCAVATING, THE CONTRACTOR SHALL CALL FOR BLUE STAKES AT THE BLUE STAKE CENTER CENTER (PHONE: 1800-STAKEIT)
- 5. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS PRIOR TO CONSTRUCTION THE FLOOD CONTROL DISTRICT OR TOWN OF BUCKEYE IS NOT RESPONSIBLE FOR MEALITY ACCREBED DUE TO DELAYS ANGVOR DAMAGE TO UTILITIES IN CONJUNCTION WITH THIS CONSTRUCTION.
- 7. ANY WORK PERFORMED WITHOUT THE APPROVAL OF THE FLOOD CONTROL DISTRICT AND/OR THE ENGINEER AND ALL WORK AND MATERIALS NOT IN CONCINCIONAINCE WITH THE SPECIFICATIONS IS SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE
- 8. THE ENGINEER WILL DETERMINE THE NUMBER AND LOCATION OF THE REQUIRED COMPACTION TESTS FOR STRUCTURAL BACKFILL
- 9. TRAFFIC CONTROL SHALL BE MAINTAINED IN ACCORDANCE WITH MAG SPECIFICATION ON IPPART VIOR THE MAINUAL ON UNIFOWN TRAFFIC CONTROL DEVICES (1988 EDITION) MICLUDING REVISION 3 DATED SEPTEMBER 3:1993)
- 10 CONTRACTOR SHALL REPLACE PAVEMENT TO THE EXISTING GRADES SHOWN ON THE PLANS
- 11. EXACT POINT OF MATCHING TERMINATION AND OVERLAY WILL BE DETERMINED IN THE FIELD BY THE ENGINEER
 - 12. NO JOB WILL BE CONSIDERED COMPLETED UNTIL CURBS, PAVEMENT AND SIDEWALKS HAVE BEEN SWEPT CLEAN OF ALL DIRT AND DEBRIS
- PRIOR TO FINAL APPROVAL AND ACCEPTANCE OF THE WORK, THE CONTRACTOR WILL BE REQUIRED TO CIEM ADJACENT (OFF-PROJECT) ROJOWAY'S USED DURIN THE OWNER OF CONSTRUCTION
- CATCH BASIN CONNECTOR PIPES SINALL BE LUID ON A STRANGHT AUGMENT AND SLOPE MILESS OTHERWISE SPECIFIED IF BREWS WI ALIGNMENT AND SLOPE ARE RECESSARY TO MEET FIELD CONDITIONS THE BANKIMA DEFLECTION SHALL BE ZES DEGREES CONTINACTOR SHALL PROVIDE A PIPE COLLAR PER MAG DETAIL 895 ATT EACH DEFLECTION.
- CONNECTOR PIPES SHALL CONNECT TO CATCH BASINS WALLS AT AN ANGLE NOT TO EXCEED 225 DEGREES FROM PERPENDICULAR
- 16. CONTRACTOR IS RESPONSIBLE FOR FILING A NOTICE OF INTENT (NO) TO CONSTRUCT WITH THE ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY. CONSTRUCTION OF THE PRINCIPAL SPILLMAY REQUIRES A PERMIT FROM THE ARIZONA DEPARTMENT OF WATER RESOURCES WORK CANNOT COMMENCE UNTIL THIS PERMIT IS GRANARIADED.
 - 18. UTILITY RELOCATIONS WILL BE PERFORMED BY THE UTILITY COMPANIES NOTED IN THIS PLAN SET.

ARIZONA WATER COMPANT

WT-303

SHEET 2 OF

FOR WATER ONLY

TOWN OF BUCKEYE ENGINEERING NOTES (BUCKEYE RIGHT-OF-WAY)

- THE CONTRACTOR SHALL WAKE NO CLAIM AGAINST THE OWNER OR THE ENGINEER REGARDING ALLEGED IN ACCURACY. OF CONSTRICTION STAKES SET BY THE ENGINEER NEW MANAMEN INTECT AND OWNER VERRIED SET BY THE REGARDER ARE MANAMEN INTECT AND CANNOR OF THE ENGINEER THE STAKES SET BY THE MANAMEN INTECT AND CANNOR OF THE ENGINEER THE STAKES OF SHORT OF THE STAKES OF THE CONTRACTOR OF SUBCONTRACTOR.
 - NOTHING CONTAINED IN THE CONTRACT DOCUMENTS SHALL CREATE NOR SHALL BE CONSTRUED TO CREATE, ANY CONTRACTUAL RELATIONSHIP BETWEEN THE ENGINEER AND THE CONTRACTOR OR ANY SUBCONTRACTOR.
- THE ENGINEER WILL NOT BE RESPONSIBLE FOR CONSTRUCTION MEMS. PREMOS, TECHNOLISE, SECURES ON PROPERTIONS OF PROSERVETY PRECAUTIONS OF PROSERVETY WILLIAMS THE PROSERVE ON THE CONTINCTION OF PROSERVETY THE WILLIAMS TO GRAND THE CONTINCTIONS FAULTHE TO GRAND HE WILL NOT THE WORK IN ACCORDANCE WITH THE CONTINCT DOCUMENTS.
- EXISTING UTILITIES SHOWN ON THESE PLANS HAVE BEEN LOCATED ACCORDING TO INFORMATION PROUNDED BY THE AGENCY OF SECTING ECHA JITLIT LOCATIONS SHOWN ARE APPROXIMATE STATE FOR ECONSTRUCTION PROCESSED ALL BOOKS FROD LOCATION & GROUP SESSES AS HOURS PRICE FOR ECON SECTION & GROUP SESSES AS HOURS PRICE OF ONSTRUCTION.
 - THE ENGINEER AND APPLICABLE AGENCY MUST APPROVE, PRIOR TO CONSTRUCTION, BY ALTERATOR OR VARANCE FROM THESE PLANS ANY VARATIONS FROM THESE PLANS SHALL BE PROPOSED ON CONSTRUCTION FIELD PRINTS AND TRANSMITTED TO THE ENGINEER, 823-847-4681.
- THE CONTRACTOR SHALL PROTECT AND MAINTAIN ALL EXISTING UTILITIES ON THE BYEATY DAMAGE TO EXISTING UTILITIES WHETHER SHOWN OF MOT ON THE DAWNINGS SHALL BE REPARECHRELACED AT THE CONTRACTOR'S EXPENSE, EXISTING FEATURES AND FENCING SHALL BE REPLACED IN KIND.
 - ANY MAYECTION BY THE CITY. COUNTY OR THE ENGINEER, SHALL NOT IN ARM WAY PRELEVE THE CONTRACTOR FROM ANY OBLIGHTON TO PERFORM THE WORK IN STRICT COMPLIANCE WITH APPLICABLE CODES AND AGENCY REQUIREMENTS.
- CONTRACTOR TO LOCATE ALL EXISTING PROPERTY MONUMENTS PRIGR TO EXEMPRECTOR WAY MONUMENTS DISTURBED DURING THE CONSTRUCTION OF THIS PROJECT SHALL BE REPLACED BY A REGISTERED LAND SURVEYOR AT THE CONTRACTOR'S EXPENSE.
 - TOAFFIC CONTROL SHALL BE MANTAINED IN ACCORDANCE WITH THE MAG SPECIFICATION OF AND THE CITY OF PHENIX SHREATOR, MANUAL PROGR TO FINAL APPROVAL AND ACCEPTANCE OF THE WORK THE OPERCHOPER CONTRACTOR WILL BE REQUIRED TO CLEAN AND REPART ADJACENT (OFF-PROJECT) ROJDMAYS USED OR DAMAGED DURING THE COURSE OF CONSTRUCTION.
- CONTRACTOR IS RESPONSIBLE FOR PROTECTIVE ALL STORES UPANN PRES. THE ADMINISTRATION TO BENAMER PROTECTIVE ALL STORES OF CONSTRUCTION AND STORES OF CONSTRUCTION AND STORES OF CONSTRUCTION AND STORES STORES OF FINAL STORE STORES PRES. FLAGENG OF SIGNAGE STOLES STORES CHOICE STOLE STOL
 - THE ENGINEER WAKES NO REPRESENTATION OR GUARANTEE REGARDING LEARTHNOW ON COMMITTEE FROM MILE BACHMONEY GRAT THIS PROJECT WILL BALANCE DUE TO THE VARMING FIELD CONTON COMMISSION OF THE PROJECT ON THE PROJECT ON TOWN TRANSPRICTION OF THE CONTON CONTENTED TO THE ENGINEER THE ENGINEER CONTONS THE ENGINEER.
- PRIOR TO BIDDING THE WORK THE CONTRACTOR SHALL THOROUGHLY STATES HUBBLE AS TO THE CALFULA, CONFLIONS AND EASTHWORK QUARITIES; IF ANY NO CLAIM SHALL BE MADE AGAINST THE OWNER OF ENOINER OR ANY EXCESS OR DEFICIENCY THEREIN, ACTUAL OR RELATIVE.

OF BUCKEYE 3 NOTES

- CONSTRUCTION SHALL BE IN ACCORDANCE WITH CURRENT MAG SPECIFICATIONS DEFIALS.
- THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS PRIOR TO CONSTRUCTION
- TOWN OF BUCKEYE INSPECTION DEPARTMENT SHALL BE NOTIFIED 48 HOURS IN ADVANCE OF ANY ON-SITE CONSTRUCTION, PHOME 823-547-4661 ATTENTION MICHAEL VALENTINE.
 - MAY WORK PERFORMED WITHOUT THE APPROVAL OF THE TOWN OF BUCKEYE BUILDING DEPARTMENT MAZOR ALL WORK AND MATERIAL NOT IN CONFORMANCE WITH THE SPECHPOLITIONS IS SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTORYS EXPENSE.

PAVING NOTES (CONTINUED)

- THE CONTRACTOR WILL UNCOVER ALL EXISTING LINES BEING TIED INTO TO VERIEY THEIR LOCATION, THE CONTRACTOR WILL LOCATE OF A MAIL LICACE BAT ALL EXISTING UNDERGREGATION LILL LOCATE OF A MAIL LICACE BAT CHARLE STOWNED OF CONSTRUCTIONS IN ADVIANCE OF CONSTRUCTIONS IN ADVIANCE OF CONSTRUCTION WAS WILL ELEMBRIATE ALL CONFLICTS PROOR TO START OF CONSTRUCTION. BLUE START OF CONSTRUCTION.
 - THE TOWN OF BUCKEYE IS NOT RESPONSIBLE FOR LUBBLITY ACCRUED DUE TO DELAYS MADOR DUMAGES TO UTILITIES IN CONLUNDATION WITH THIS ONENTRACION ALSISTIF TOWN WILL NOT PARTICIPATE IN THE COST OF CONSTRUCTION. OF UTILITY RECOCATION.
- NO FINAL ACCEPTANCE SHALL BE ISSUED UNTIL "AS BUILT" PLANS CERTEFED BY THE FORMICHE THAT EBER SUBMITTED AND ACCEPTED BY THE TORK ONE (1) SET OF MILLAR REPRODUCIBLE TWO (2) COPIES OF FULL-SIZE BLACK-LINE PRINTS AND TWO (2) COPIES OF HALF-SIZE BLACK-LINE PRINTS AND TWO (2) COPIES OF HALF-SIZE BLACK-LINE PRINTS SHALL BE PROVIDED.
 - LOCATION OF ALL VALVES MUST BE REFERENCED AT ALL TIMES BY THE CONTRACTOR DURING CONSTRUCTION.
 - NO PAVING CONSTRUCTION SHALL BE STARTED UNTIL ALL UNDERGROUND UTILITIES WITHIN THE ROADWAY ARE COMPLETED.
- BASE COURSE SHALL NOT BE PLACED ON SUBGRADE UNTIL BASE REQUIREMENTS HAVE BEEN COMPLETED AND APPROVED BY THE TOWN.
- ALL RETURN TYPE DRIVEWAYS WITH CONCRETE PAVEMENT SHALL UTILIZE MAG CLASS A CONCRETE FOR ALL CONSTRUCTION WITHIN THE RIGHT-OF-WAY.
 - GUTTERS SHALL BE WATER TESTED IN THE PRESENCE OF THE TOWN'S AUTHORIZED REPRESENTATIVE TO ENSURE PROPER DRAINIGE, PRIOR TO FINAL APPROVAL BY THE TOWN.
- EXACT POINT OF MATCHING TERMINATION AND OVERLAY,IF NECESSARY,MAY BE DETERMINED IN THE FIELD BY THE TOWN.
- NO JOB WILL BE CONSIDERED COMPLETE UNTIL ALL PAVEMENT HAVE BEEN SWEPT CLEAN OF ALL DIRT AND DEBRIS.
- THE CONTRACTOR SHALL KEEP SUITABLE EQUIPMENT ON HAND AT THE JOBSITE FOR MAINTAINING DUST CONTROL, AND SHALL CONTROL DUST AS DIRECTED BY THE TOWN.
- THE CONTRACTOR SHALL PROVDE ADEQUATE MEANS FOR CLEANING TRUCKS AND/OR OTHER EQUIPMENT OF WHIP PRORY PO ETHERING DIAGOS STREETS TO THE CONTRACTOR'S RESPONSIBILITY TO CLEAN STREETS AND TAKE WINTEUER MISCURES ARE NECESSERY TO ENDERE THAT ALL ROADS ARE MINITAINED IN A CLEAN, MUD. AND DIAGOS PROMISSION AT ALL THIRES.
- TRAFFIC CONTROL SHALL BE MAINTAINED IN ACCORDANCE WITH MAG SPEC, 401 AND THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
- DISPOSAL OF EXCESS MATERIAL WITHIN THE TOWN LIMITS IS PROHIBITED. A USE PERMIT IS REQUIRED FOR DISPOSAL OR STOCKPILING OF MATERIAL WITHIN A RESIDENTIAL AREA.
 - 18 STOCKPILING OF EXCAVATED MATERIAL SHALL NOT EXCRED A HEIGHT OF SIX (8) FEET ABOVE THE MATRIAL GROUND ELEMENTHE SLOPES ON ALL SIZES OF STOCKPILES. EXCANTED MATERIAL SHALL NOT EXCRED A 1 TO 4 PARTO OF PEGRIT.
 - 20. ALL CONTRACTORS SHALL CONTRACT FOR PRIVATE TRASH PICKUR.
- ALL ABC SHALL BE FROM AN ADOT APPROVED SOURCE, LISTED ON THE ADOT APPROVED LIST, PUBLISHED ON THER WEBPAGE.

TOWN OF BUCKEYE GRADING NOTES

- ALL DESIGN AND CONSTRUCTION MUST BE IN ACCORDANCE WITH THE UNIFICAL SYMMODOW SECRETORY AND DESIGNATION AND DEFINALS FOR PUBLIC WORKS CONSTRUCTION TO PUBLISHED BY THE MARCON ASSOCIATION OF GOVERNMENTS (MAGINECEPT AS MAGINED BY THE TOWN OF BUILDER'S SYMMODO CONSTRUCTION DETAILS. ALL INPROVEMENTS WITHIN THE DEVELOPMENT MICLIONION OF STIEL INPROVEMENTS WITHIN THE UNIFIEST TOWN OF BUCKEYS ENRINGED BY SANDARDS.
- NO GRADING SHALL BEGIN WITHOUT A PERMIT FROM THE TOWN OF BUCKEYE.
- 3. OFFISTE CONSTRUCTION REQUIRES SEPARATE PERMIT BY THE TOWN OF BUCKEYE.
 - CONTRACTOR SHALL NOTIFY THE TOWN OF BLICKEYE PUBLIC WORKS DEPARTMENT ASSISTED THE ATLAST TWENTY-FOUR 9240 HOURS IN ADVANCE OF ANY REQUIRED CONSTRUCTION INSPECTION.
- CONTRACTOR MUST CALL THE ARIZONA BLUE STAKE CENTER (862) 283-190 FORTY-EIGHT (48) HOURS BEFORE DIGGING OR EXCAVATING FOR LOCATION ALL UNDERSROUND UTILITIES.
- IT IS THE RESPONSIBILITY OF THE DEVELOPER AND HISHER AGENT IN COMENATING THE RELOCATION OF POWER POLES FROM THE APPLICABLE UTILITY COMPANY.
- 8. ALI STAKING INCLIDING FINISHED FLOOR ELEVITYONS IS THE SOLE RESPONSIBILITY OF THE DEVELOPER'S REGISTERED CHUL ENGINEER AND LAND SURVEYOR, SUBMISSION OF CERTIFIED PAGE ACCEPTANCE. 7. NO MINIMUM FINISHED FLOOR ELEVATION SHALL BE ALTERED, UNLESS APPROVED BY PUBLIC WORKS AND THE DEVELOPER'S CIVIL ENGINEER.

GRADING NOTES (CONTINUED)

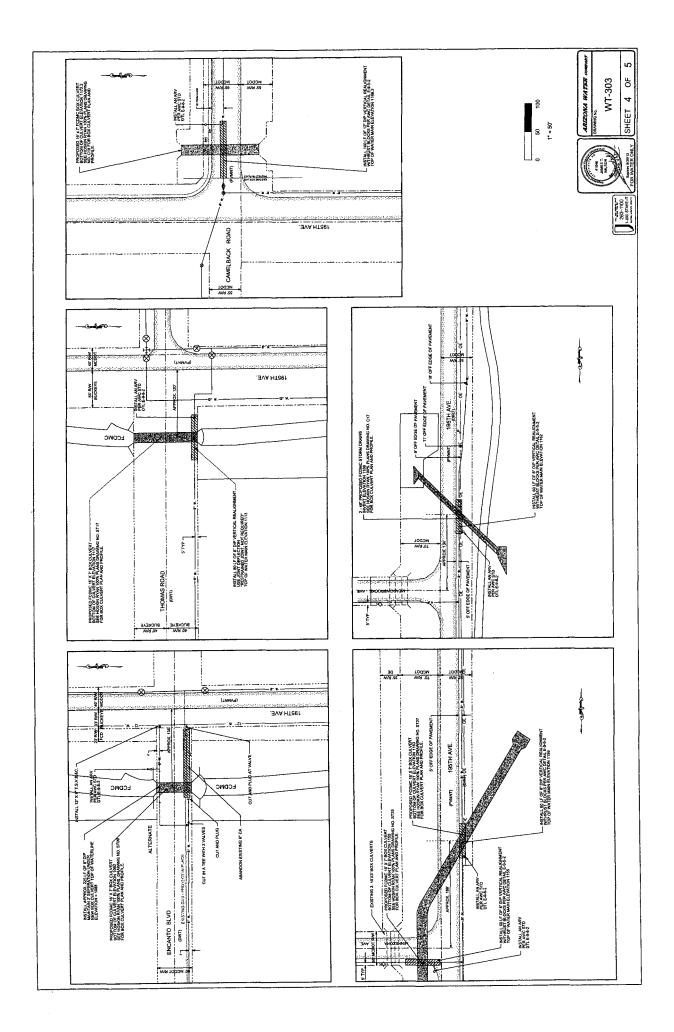
- CONTRACTOR SHALL PROVIDE GRADING FOR POSITIVE DRAINAGE IN ALL RETENTION BASINS AT ELEVATIONS AS ABUTTING PUBLIC RIGHT OF WAY.
 - DRVWELL INLET GRATE SHALL BE 0.30 FEET ABOVE FINISH GRADE AT BOTTOM ELEVATION OF THE RETENTION BASIN.
 - 11. DRILING LOSS FOR DRYNELL AT 5.0 FOOT INTERVALS INCLUDING LITHOLOGY CHARGES MILL SE FURNINEED TO THE TOWN OF BUCKEYE PUBLIC WORKS DEPARTMENT PROR TO THAL ACCEPTANCE.
- PERCOLATION TESTS WILL BE REQUIRED OF COMPLETED DRYWELLS PRIOR TO ACCEPTANCE, SHOULD ENSINENS GOLD COMPITIONS BE ENCONTRINED WHICH LLCX SUFFICIENT PERCOLATION RATES ADDITIONAL DRYWELLS OF AN ALTERNATE RENO FOR DISPOSAL WILL BE REQUIRED FINAL CERTIFIED PERCOLATION TEST RATES FROM ASYN D. SASS SHALL BE SUBMITTED AT THE TIME OF AS-BULLTSWITH THE REQUIRED GOS REDUCTION FACTOR.
 - DRYWELL CONSTRUCTION SHALL BE DONE ONLY BY A CONTRACTOR LICENSED BY THE ARROND DEPARTMENT OF ENVIRONMENTAL QUALITY WITH THE APPROVED SETSATION FOR EACH DRYMELL.
- THE APPROVED DRYWELL REGISTRATION SHALL BE SUBMITTED TO THE TOWN BY THE DEVELOPER OR HISHER CIVIL ENGINEER AT THE TIME AS-BUILT'S ARE SUBMITTS.
- CONTRACTOR SHALL COURTY WITH THE PROVISIONS FOR WORK ZONE SYFTEY AND TRAFFIC CONTRAC LOWER WITH THE PROVISIONS FOR WITH MANUAL ON UNIFOWN TRAFFIC CONTRAC LOWES (WITHOUT 20 03 EDITION) AND WHERE BUCKER, EMDORT, MODIT'S TRAFFIC CONTRAC LIMINAL FOR HIGHWAY CONTRACTORY AND WANTER TOWN OF STATEMENT CONTRACT WANTER. FOR HIGHWAY CONSTRUCTION, AND MANTENANCE (MOST CURRENT EDITION).
- ALL RETENTION BASINS WIST DRAWN ANY STORM EVENT UP TO AND INCLUDING THE TOWN VERY 2 HORS STORM WITHIN THEITY-SAY (38) HOUSE OF FOST THIS DEFELOAMENT CONSTRUCTION OWNERS OF WAS SAY RAUDING TO MEET THIS REQUIREMENT WIST TAME CORRECTIVE ACTION TO BRING THE BASIN INTO COMPLIANCE.
- THE CONTRACTOR SHALL NOT DISTURE EXISTING SURVEY MONUMENTS OR BENCHMANS NOTED ON THE PLANS REMOVIL, WAS REFLECKEN SHALL BE DOME BY AN HAZONA REGISTERD LAND SURVEYOR ONLY.
- THE CONTRACTOR SHALL HAVE SUFFICIENT MEMS TO PROVIDE DUST CONTROL DUST SHALL BE CONTROLLED IN ACCORDANCE WITH THE MARICOPA COUNTY ENVIRONMENTLE SERVICES.
- IS, PERIMETER WALL FENCES ARE REQUIRED TO BE COMPACTED NO LESS THAN 90% BY THE CONTRACTOR.
- 21. THE CONTRACTOR SHALL PROVIDE ADEQUATE MEANS FOR THE ELIMINATION OF MUD AND DUST ACCUMULATION IN PUBLIC STREETS BY TRUCKS LEAVING THE SITE (TRACK OUR DEVICES) PUBLIC BRISHT OF MAYS SHALL BE KEPT CLEAN AND FREE OF DEBRIS FROM CONSTRUCTION SITES. 20. ARRANGEMENTS FOR CONSTRUCTION WATER CAN BE MADE BY CALLING THE TOWN OF BUCKEYE PUBLIC WORKS DEPARTMENT AT 623-349-6800.
- 22 DISPOSAL OF EXCESS MATERIAL WITHIN THE TOWN'S LIMITS IS PROHIBITED A
 USE PERMIT IS REQUIRED FOR DISPOSAL AND/OR STOCKPILING MATERIALS WITHIN
 A RESIDENTIAL MERA.
- 23. APPROVED CONSTRUCTION PLANS SHALL BE KEPT ON THE JOBSITE AT ALL TIMES. DEVINATION FROM THE PLANS IS NOT ACCEPTABLE UNESS. AN APPROVED PLAN REVISION HAS BEEN GRANTED BY PUBLIC WORKS DEPARTMENT.

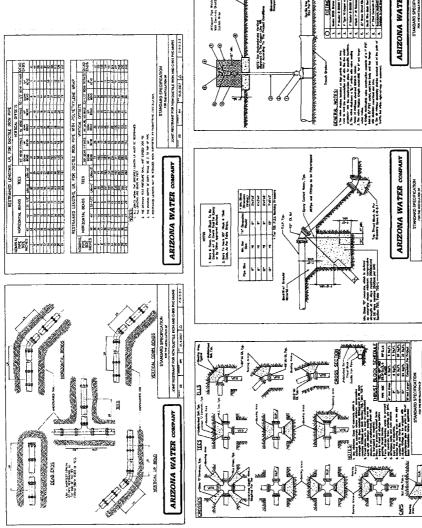


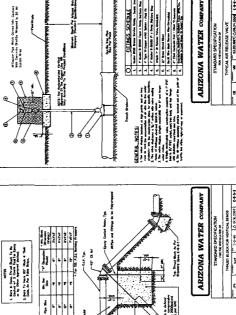


WT-303

R SHEET 3









ENVIRONMENTAL SERVICES DEPARTMENT 1001 N. Central, Suite 201 Phoenix, AZ 85004-1940



Division of Water and Waste Management Subdivision Infrastructure & Planning Program (602) 506-1058 FAX (602) 506-5813

MCESD Project: No. 110111 PWS SYSTEM No. 0407128

CERTIFICATE OF APPROVAL TO CONSTRUCT (WITH STIPULATIONS) PUBLIC WATER SYSTEM EXTENSION

PROJECT DESCRIPTION: <u>Vertical Realignment for the White Tank Outfall Channel</u> – Relocate various sections of water main at various locations along 195th Avenue to accommodate FCDMC new flood control improvements with a point of connection to the Arizona Water Company water system.

LOCATION:

Litchfield Park, Maricopa County

Section 21, S29, T2N, R2W

195th Avenue from Encanto to Camelback

PROJECT OWNER:

James T. Wilson, Engineer Arizona Water Company Post Office Box 29006 Phoenix. AZ 85038

Pursuant to Arizona Administrative Code (AAC) Title 18: Chapters 4 and 5 and the Maricopa County Environmental Health Code: Chapters IV and V.

Approval to construct the above described facilities as represented in the approved plan documents on file with the Maricopa County Environmental Services Department is hereby given subject to the following stipulations: **NONE**

Operation of this public water system project shall not begin until an Approval of Construction is issued by Maricopa County Environmental Services Department.

WATER AND WASTE MANAGEMENT DIVISION

Wesley A. Shonerd, PE, Program Manager

Subdivision Infrastructure & Planning Program

From the approval date noted above this certificate will expire if construction has not commenced within one year, there is a halt in construction of more than one year or construction is not completed within three years.



MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION PERMIT FOR CONSTRUCTION IN COUNTY RIGHT-OF-WAY

TRACKING No.: TC20070122

ISSUED:01/19/2007 Extended: Expires:07/18/2007 Completed:

Phone:

Phone:

Phone:

The undersigned herewith makes application for a permit to enter upon and use a portion of the right-of-way of the Public Highway, Street, or Alley, in _, (_) Subdivision, or the MONTE VISTA BOOSTER PUMP STA & WATER L Located at THOMAS RD & 195TH AVE in the NE1/4 of Section 32, Township 02N, Range 02W for the purpose of:

INSTALLING APPROX 4000 LF OF 12" DIP & 2640 LF OF 6" DIP

FOR AND IN CONSIDERATION of the granting of a permit of license for the purpose set forth therein, licensee hereby agrees, covenants, and bids said licensee to attached conditions hereon.

IN WITNESS WHEREOF, this application has been duly signed this

Applicant's Signaturex_	a-11/19/	Applicant	(PRINT) JOE WHELAN

Applicant: ARIZONA WATER COMPANY Address: P O BOX 6010 EL MONTE 91734

Owner: ARIZONA WATER CO JOE WHELAN

Contractor: ARIZONA WATER COMPANY

Contact: JAMES WILSON Contractor No.: TC03000163 Phone: 602-240-6860

FEES AMOUNT

\$0.00//\$4,869.60 Permit Fee: Insurance Expires:12/31/2007

Early Pavement Cut Fee: \$0.00 Project Bond Amount:0

Working without Permit Fee: \$0.00 Processing Fee: \$50.00

Total Fees: \$4,919.60 Permit Bond Amount: \$0.00

Construction shall be in accordance with the latest MAG Uniform Standard Specifications, Amendments, and Maricopa County Supplements thereto; approved plans and the latest Maricopa County Special Provisions.

Comments:

JOB # WT-265 SEE ATTACHED SHEET FOR SIGNATURE

APPROVED TRANSPORTATION DIRECTOR

PHONE 602 506-8609 FOR INSPECTIONS 24 HOURS IN ADVANCE

DATE 23 January 2007

ARRANGEMENTS FOR ROAD OBSTRUCTION OR CLOSURES MUST BE IN ADVANCE WITH TRAFFIC ENGINEERING AT 602 506-4625



PUBLIC WORKS AND UTILITIES

Building Safety Department

530 East Monroe Avenue. Buckeye, AZ 85326

Office: (623) 349-6200

Inspection Request Hotline: (623) 349-6248; Online Inspection Requests: www.buckeyeaz.gov

Project Inforn	nation		Per	mit#	PUW-11-00052		
Permit Type	Public Works and Util	ities	Pro	ect Name	6" WATERMAIN		
Site Address	195TH AVE & THOM	IAS RD	Par	el#			
Project Descri	iption AZ WATER CO	TO LOWER A	N EXISTING 6"	WATERMA	AIN IN TOB PER APP	ROVED	
Names Associ	ated with this Project	···					
Туре	Name	~ Co	ntact	Phone #	License #	Ex	p Date
Applicant	Arizona Water Compa	any: White					
Owner	Town Of Buckeye						
Contractor	Arizona Pipe Masters	• •		0 -	248737	07/	31/2011
Contractor	Arizona Pipe Masters			0 -	2644	04/	30/2012
Fee Information	on		Project Valuati	on:		3	\$5,400.00
Right Of Way I	Permit Fee	45.00	Туре	•		Qty	UOM
Building Permi		162.00	Public Works	•		1	VAL
T	otal Fees Paid	\$207.00	Project Details				
	•	•	Setback - Front				
			Setback - Side	• *			
· .		P I	Setback - Rear		•		
	10 ADD 0 0 000		Setback - Other		•		
•	APR 2 6 2011		Subdivision:	•			
	I'm in it	5	Lot Track:				
•	BLOLI 11-00	<u> </u>	Assessor Code		325]

I certify that I am the owner/duly authorized owner's agent, that I have read this application and that all information is correct. I certify that I have read/understand and will comply with all of the provisions outlined. The applicant is advised that issuance of this permit will not relieve responsibility of the owner or owner's agents to comply with the provisions of law/ordinances, including federal/state/ jurisdictions, which regulate construction/performance of construction, or with any private deed restrictions or requirements of applicable fire district.

Town of Buckeye Building Offical

Signature

Print Name

Heen

Date Issued:

Issued By:

Date Expires: 09/03/2011



MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION PERMIT FOR CONSTRUCTION IN COUNTY RIGHT-OF-WAY

IRACKING	No.	$\cdot \mathbf{T}$:	C20	11	01	92

ISSUED:02/24/2011

Extended:

Expires:08/17/2011

Completed:

The undersigned herewith makes application for a permit to enter upon and use a portion of the right-of-way of the Public Highway, Street, or Alley, in _, (_) Subdivision, or the <u>WHITE TANK OUTFALL CHANNEL</u> Located at <u>195th AVE FROM ENCANTO TO CAMELBACK</u> in the <u>VAR</u> of Section <u>VAR</u>, Township <u>02N</u>, Range <u>02W</u> for the purpose of:

WORK IN ROW

FOR AND IN CONSIDERATION of the granting of a permit of license for the purpose set forth therein, licensee hereby agrees, covenants, and bids said licensee to attached conditions hereon.

Applicant's Signature Roy Regument Applicant (PRINT) JOE WHELAN

Applicant: ARIZONA WATER COMPANY

Address: P.O. BOX 29006 PHOENIX 85038

Owner: ARIZONA WATER COMPANY

Contractor: ARIZONA WATER COMPANY

Contractor: ARIZONA WATER COMPANY

Contractor No.: TC03000163

Contact: JOE WHELAN

Phone: 1-520-705-7289

Phone: 602-240-6860

FEES	AMOUNT		
Permit Fee:	\$0.00//\$0.00	Insurance Expires:03/	01/20
Early Pavement Cut Fee:	\$0.00	Project Bond Amount:0	
Working without Permit Fee:	\$0.00	•	
Processing Fee:	\$0.00		
Total Fees:	\$0.00	Permit Bond Amount:	\$0.00

Construction shall be in accordance with the latest MAG Uniform Standard Specifications, Amendments, and Maricopa County Supplements thereto; approved plans and the latest Maricopa County Special Provisions.

Comments:

JOB # WT-303 TRAFFIC CONTROL WILL BE REQUIRED NO FEE PERMIT WORK RELATED TO MCFLOOD PROJECT

APPROVED
RANSPORTATION DIRECTOR

RY

PHONE 602 506-8609 FOR INSPECTONS 24 HOURS IN ADVANCE DATE

ARRANGEMENTS FOR ROAD OBSTRUCTION OR CLOSURES MUST BE 24 HOURS IN ADVANCE .
WITH TRAFFIC ENGINEERING AT 602 506-4625



Cass Grande Offica: PO Box 11030 - Casa Grande, AZ 85130-1030 Volce : 520-836-8785 Fax; 520-636-2859

		PROPOSAL/CONTRAC					
co	INTRACTOR: ANIZONA PIPEMASTERS, INC.	White Tan					
AD	DRESS. P.O. BOX 945	W.A. No(st:					
СП	YSTZIP: LITCHFIBLY PARK, AZ 85340	February 15, 201					
WWC MAN	CONTRACTOR SUBMITS this PROPOSAL/CONTRACT to ARIZONA WATER COMPANY an Anzona corpo described on Page 2 (the "Project"), as an independent prime contractor.	ration (the "Company") to perform the work and complete the project					
t.	Contractor certifies that it has a comptale copy of, and has read, understands and accepts the Company's Get Specifications and Standard Specification Drawings, title "Specifications"), all of which are attached hereto. Of drawings for the Project (the "Drawings"), copies of which are also attached hereto. The General Conditions or Proposal/Contract. Contractor offirms that all work and materials to be furnished or purchased for the Project Specifications and Orawings.	ontractor has examined the specific plons and related construction I Contract, Specifications and Drawings are incorporated into this					
2.	Contractor represents and warrants that it has satisfied and complied with the provisions of Section 6, Contract Conditions of Contract prior to automitting this Proposal/Contract.	for Understands Work and Working Conditions, of the General					
3	Contractor represents that this Proposal/Contract is fair and honest in all respects, is submitted in good faith or person.	is not submitted in collusion with any other company, entity or					
đ	Contractor acknowledges that one hundred percent (100%) Performance and Payment Bonds are required and must be provided to the Company prior to the commencement of work.						
5.	Prior to the commencement of work, Contractor will submit to the Company a tist of all materials to be used in the Project. The materials list will include the manufacturer, part number, price and quantity included to this Proposat/Contract.						
6.	Contractor will furnish all labor, tools, equipment and materials required to complote the Project according to the materials purchased by Contractor to be incorporated into the Project are subject to tax at the item of purchase Contractor will pay the applicable transaction privilege tax (the "Contracting Tax") on the Project after Contractor. The cost of materials incorporated into the Project which are exempt by Arizona Revised State Status ("A.R.S diameter of four (4) inches or targer, including equipment, filtings and any other related part that is used in oper in the total cost of the labor and materials upon which the Contracting Tax is computed. Contractor retains full indemnify the Company against any demand or obligation to pay the Contracting Tax.	and Contractor will not chargo the Company for any such tax is receives payment of the final Project Involce from the Company. ") from the Contracting Tax, for example, pipes or valves having a ating the pipes or valves (A.R.S. §42-5061 B.6.), will not be included.					
7.	Contractor will maintain detailed accounting records of all materials purchased and incorporoied into the Project. Such records will include all supporting original vendor invoices for all materials purchased. Following completion of the Project, Contractor will submit an itemized accounting to the Company which will include all supporting original vendor invoices and satisfactory avidence of payment thereof. The Company will not pay Contractor for materials not actually incorporated into the Project, and the disposition of such materials will remain Contractor's responsibility.						
8.	The Estimated Total Cost of the Project, shown on Page 2, is based on estimated tabor and naterial quantities to be furnished. It includes an ostimate of the Contracting Tax and the cost of the required Performance and Payment Bonds. Contractor will not cancel modify or withdraw this Proposal/Contract during a ninaty-day (90) period. On the Bid Duo Date. The Company may accept this Proposal/Contract by signing and mailing, or otherwise delivering, a copy hereof to Contractor during such ninety-day (90) period. If the Company does not accept this Proposal/Contract during such ninety-day (90) period. Contractor may cancel this Proposal/Contract by giving written notice of cancellation to the Company.						
9.	Prior to the commencement of work, Contractor will provide the Company with a detailed construction schedule, to either Gantt or CPM form, identifying all tasks to be performed from the date of the writton Commencement Notice through completion of the Project, including testing, training of Company Personnel and final Project invoicing. Contractor will provide the Company with a copy of such construction schedule documenting the progress of work on the Project at feest monthly						
10.	Contractor will not commence work on the Project until the Company gives Contractor o written Commencement Notice. Contractor will complete the Project within collendar days after the Commencement Notice is issued						
11.	Following the Company's written notice of stitisfactory completion of the Project, and upon receipt of the final Pro actual total cost of the Project, which will be calculated as shown on Page 2, except that octual lobor and materials quantities and the Contracting Tax will be recalculated based on such actual labor.	al quantities installed/constructed will be substituted for the					
t2.	The amount of applicable liquidated damages for Contractor's fallure to deliver or perform within the time limit st payment of the final Project invoice. This provision shall not limit the Company's ability to terminate this Proposi perform as provided in the General Conditions of Contract, Specifications or Drawings, or in this Proposal/Contract.	al/Contract for Contractor's unsatisfactory performance or fatiure to					
SPE	CIAL CONDITIONS:	And the second s					

NONE

CONTRACTOR	PROPOSAL/CONTRACT ACCEPTED:
AMIZONA PIPEMASTERS INC.	ARIZONA WATER COMPANY
	By: Julium & Sulliant Print Name. Fredrick K. Schneider, PE
Print Name: DAW WITT	Print Name, Fredrick K. Schneider, PE
and the second s	Title: Vice President - Engineering
Date: 03-33-11	Dute. #-5-2011



Casa Grande Office: PO Box 11030 - Casa Grande, AZ 85130-1030 Volce: 520-836-8785 Fax: 520-836-2850

PROPOSAL/CONTRAC	TRAC	NTR	100	ΔI	OS)P	RC	P
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CONTRACTOR: ARIZONA PIPE MAST	ens, Inc.		and the state of t	White Ta	ank
AZ CONTRACTOR LICENSE NO: ROC 244737	CLASSIFICATION	KA		Isa w. 140(2)	D. mineral money of public designs of the control o
The state of the s				BIO DUE DATE	
ADDRESS: P.O. Box 945	MANGO A CONTRACTOR OF THE CONT			March 1	8, 2011
CITYSTZIP LITCHFIELD PARK, AZ	82340	a marka a sa	ANNESETTANIA MENANTANIA MANAMATANI	✓ Yes	
Relocate various sections of was south of Camelback Road, a to control channel.					
Angune de la marque de la companya del la companya de la companya del la companya de la companya			T PRICE	ATOT	L COST
1.2 MATERIAL STREET FRANCE CONTRACTING TAY Ince	Decement 6) Augusta				
1-2. MATERIALS EXEMPT FROM CONTRACTING TAX (per			MATERIALS	_LABOR_	MATERIALS
Install 6" Ductile iron pipe vertical realignment with related fittings	305 L.F.		36.35	73810 00	.4056.25
Install 8" Ductile iron pipe vertical realignment with related fittings Instalt 12" Ductile iron pipe vertical realignment with related fittings	180 L.F.	•	47.33	7930.60	-7619.40
Install & Tap a 12" x 6" F.S. with a 6" T.V. with related fittings	100 L F		110.00	8300.00	11000 00
Instell a 6" Fig Tee w/ 2-6" Fig x MJ G.V. a 6" Fig x 6" MJ Adpt w/ rit		330000 130000	2340.00	<u>\\</u>	3340.00
Install a 2" Blow off assembly with related fittings	1	780.00	1125.00	1 750.00	2 1125.00
Install a 6" cap / plug on existing 6" G.V. with related fittings	1	260.00	338.00	360.00°	33.4.00
SLUDDY ON 12" VENTICAL REALISHME	NT 30 CY		224.00	\$70.00	1740.00
CUT IN 8" VALVE BOX AND COVER ON I			2330.00	1,00.00	2326.00
8" ACP AT MUNEZONA AVE			ALL AND SALE AND ASSESSMENT OF THE PARTY OF		
PRICING DOES NOT INCLUDE	DUST CONTRO	OF PEN	mit		
3. Total Labor to Install Exempt Materials (edd the amounts in column			***************************************	37,640.00	11748.65
4. Total Exempt Materials (add the amounts in column 2)				IAN	4 39,765,65 1º
5-6. NON-EXEMPT MATERIALS	OUANTITY	1 4800	ALATEDIAL C	1.000	14755m10
Install air relief velve with related fittings	QUANTITY 6	LABOR	MATERIALS	LABOR	MATERIALS
ustan an ichel konz unti rataren utunika		780.00	7,32.∞	-40.00x	- 2mor00
		***************************************	•		<u> </u>
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7, Total Labor to Install Non-Exempt Materials (add the amounts in column 8).	அள் ஆ		to the second of the second	7 4680,00	سراده مرسون
8. Total Non-Exempt Materials (add the amounts in column 8)	and the second of	CAMP CONTRACTOR	ye 8 21		\$ 5410,00
9. Subtotal A (add lines 3, 7 and 8)	**	10-	*** * ***		\$ \$47,430.00 32
10. Contracting Tax Base (multiply the amount on line 9 by 0.65)	A So A So			10 \$31,154,30/	
11. Applicable Contracting Tax Rate	According to the second of the second	** * * * ***		11 10.3 %	
12. Contracting Tax (multiply the amount on line 10 by line 11)	and the second of the second	****			2 320491122
13. Subtotal B (add lines 4, 9 and 12)	4.00	New York Con-		1	3 40907,56 60.
14. t00% Performance and Payment Bonds Cost					90 26. 7676
15. Estimated Total Cost (add lines (3 and 14)	A			_11	93634.74

CONSTRUCTION SPECIFICATIONS: E-8-1

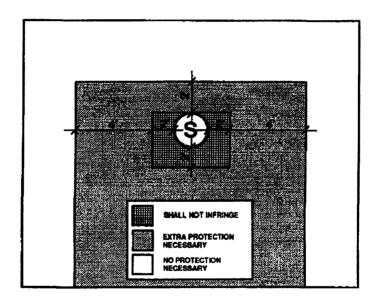
ERRATA 2010

10. PROTECTION OF WATER MAINS NEAR SEWERS

In order to protect water mains from contamination by sewers, the installation of the water mains must conform to the following requirements:

a. Horizontal - When water lines and sewers are laid parallel with each other, the horizontal distance between them shall not be less than six feet (6'). Each line shall be laid on undisturbed or bedded material in a separate trench. Where conditions prevent the minimum horizontal separation set forth above, extra protection will be required. Extra protection shall consist of constructing the sewer main with mechanical joint ductile iron pipe or with slip-joint ductile iron pipe if joint restraint is provided, or encasing both the water main and sewer main in concrete. See Detail E-9-30-1 and E-9-30-2

The Construction Drawings shall indicate the installation requirements. The drawings showing these exceptions shall have been approved by the appropriate state and/or county health department. Refer to the diagram below for clarification.



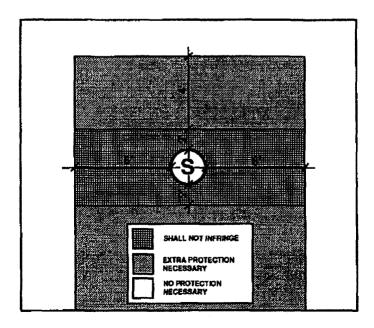
Under no circumstances will the horizontal separation between sewer mains and water mains be less than two feet (2'). All distances are to be measured from the outside of the sewer main to the outside of the water main.

b. Vertical - When a water main is parallel with or crosses a sewer main within two feet (2') above the sewer or greater than two feet (2') below the sewer, extra protection will be required. Extra protection shall consist of constructing the sewer main with mechanical joint ductile iron pipe or with slip-joint ductile iron pipe if joint restraint is provided, or encasing both the water main and sewer main in concrete. See Detail E-9-30-1 and E-9-30-2.

The Construction Drawings shall indicate the installation requirements. The drawings showing these exceptions shall have been approved by the appropriate state and/or county health department.

Under no circumstances will the vertical separation of a sewer main installed above a water main be less than two feet (2'). All distances are to be measured from the outside of the sewer main to the outside of the water main. Refer to the diagram above for clarification.

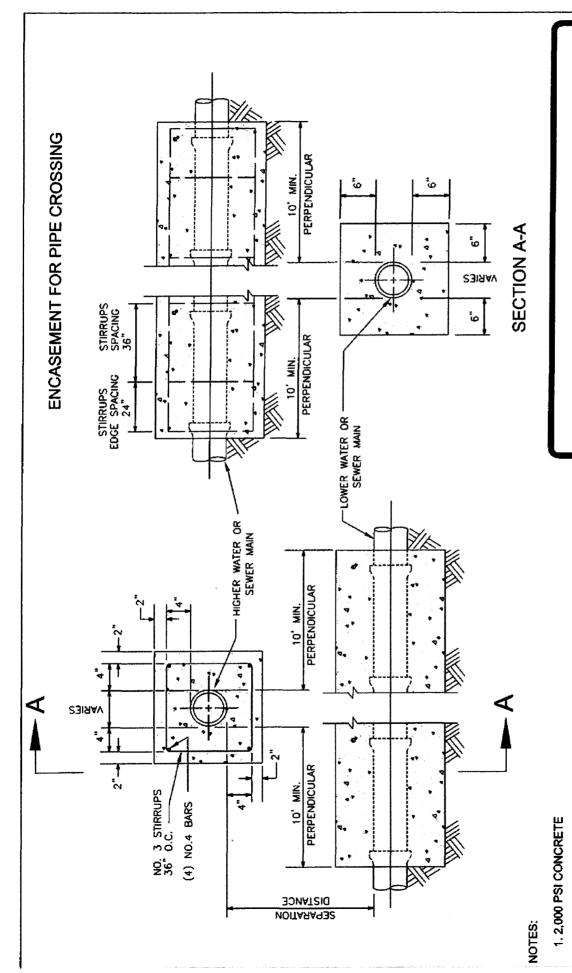
- c. When unusual conditions such as, but not limited to, highway or bridge crossings prevent the water and sewer main separations required from being met, the appropriate state and/or county health department will review and may approve requests for authorization to use alternate construction techniques, materials and joints on a case-by-case basis.
- d. No water pipe shall pass through or come into contact with any part of a sewer manhole. The minimum horizontal separation between water mains and manholes shall be six feet (6'), measured from the center of the manhole.
- e. The minimum separation between force mains or pressure sewers and water mains shall be two feet (2') vertically and six feet (6') horizontally under all conditions. Where a sewer force main crosses above, or less than six feet (6') below, a water line, the sewer main shall be encased in at least six inches (6") of concrete for ten feet (10') on either side of the water main. Refer to the diagram below for clarification.



STANDARD SPECIFICATION DRAWINGS: E-9-1

ERRATA 2010

E-9-20	INSTALLATION OF TYPICAL WELL WITH LINE SHAFT TURBINE PUMP
E-9-21	INSTALLATION OF TYPICAL WELL WITH SUBMERSIBLE TURBINE PUMP
E-9-22	INSTALLATION OF COLUMN PIPE, OIL TUBE AND LINE SHAFT
E-9-23	HOT TAP AND JUMPER METER CONNECTION
E-9-24	INSTALLATION OF TYPICAL WATER LINE ENCASEMENT
E-9-25	INSTALLATION OF CALCIUM HYPOCHLORITE TABLET CHLORINATOR
E-9-26	INSTALLATION OF CHAIN LINK FENCE
E-9-27	INSTALLATION OF SIDE HUNG WATER LINE SUSPENSION
E-9-28	PIPE WARNING TAPE, LOCATOR WIRE, AND LOCATOR WIRE TERMINATION
E-9-29	INSTALLATION OF A TYPICAL SAMPLING STATION
E-9-30-1	WATER AND SANITARY SEWER SEPARATION/PROTECTION PERPENDICULAR
E-9-30-2	WATER AND SANITARY SEWER SEPARATION/PROTECTION PARALLEL



SHALL BE REQUIRED TO PROTECT WATER MAINS FROM CONTAMINATION BY SANITARY SEWER MAINS. SEE AWC STANDARD SPECIFICATION PAGES E-8-1-9 AND E-8-1-10.

2. SEPARATION DISTANCES AND/OR OTHER EXTRA PROTECTION

3. SEE CROSS SECTION DETAIL FOR LIMITS OF SEPARATION/EXTRA PROTECTION. ALL DISTANCES ARE MEASURED PERPENDICULARLY FROM THE OUTSIDE OF THE PIPES.

4. RECLAIMED WATER SHALL BE CONSIDERED A SANITARY SEWER

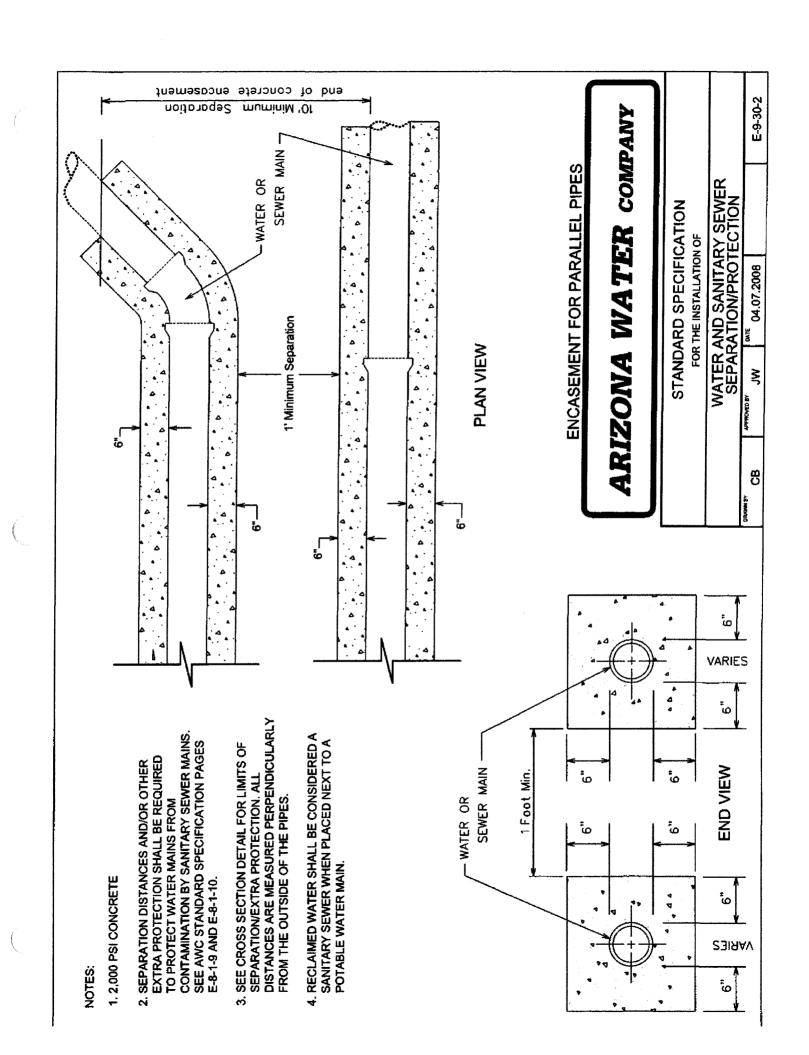
WHEN PLACED NEXT TO A POTABLE WATER MAIN.

STANDARD SPECIFICATION FOR THE INSTALLATION OF

WATER AND SANITARY SEWER SEPARATION/PROTECTION

04.07.2008 ₹ 8

E-9-30-1



3805 N. BLACK CANYON HIGHWAY, PHOENIX, ARIZONA 85015-5351 • P.O. BOX 29006, PHOENIX, ARIZONA 85038-9006 PHONE: (602) 240-6860 • FAX: (602) 240-6878 • WWW.AZWATER.COM

October 19, 2010

Mr. Jim Ryan Clow Valve Company 8121 N. 10th Avenue Phoenix, Arizona 85021

Re: Clow Medallion Fire Hydrants and Resilient Wedge Gate Valves

Dear Mr. Ryan:

Thank you for your interest in working with Arizona Water Company (the "Company") to add Clow Medallion Fire Hydrants and Resilient Wedge Gate Valves to the Company's material and equipment specifications. Based on the Clow product information you provided and your field presentations to our operations and engineering staff, the Company is pleased to inform you that the following items are approved for use in the Company's water systems in Arizona.

Medallion Fire Hydrant:

- Model F-2545
 - 5¼" MVO
 - 4½" pumper
 - 2½" hose
 - Meets AWWA C-502 standard and approval by ULFM

Resilient Wedge Gate Valves:

- Model 2639 & 2640
 - Meets AWWA C-509 Full Body Cast Iron includes 304 SS Nuts, Bolts & Low Zinc Bronze Stem
 - Size range 2½" thru 12"
- Model 2638
 - Meets AWWA C-515 Reduced Wall Ductile Iron includes 304 SS Nuts, Bolts
 & Low Zinc Bronze Stem
 - Size range 14" thru 48"

E-MAIL: mail@azwater.com

To:

Jim Ryan - Clow Valve Company

October 19, 2010

Subject:

Clow Medallion Fire Hydrants and Resilient Wedge Gate Valves

Page 2

We look forward to developing a long-term relationship with you and the Clow products. If I can be of any assistance, please call me.

Very truly yours,

Fredrick K. Schneider

Vice President - Engineering

lar

VIA EMAIL: JIM.RYAN@CLOWVALVE.COM

3805 N. BLACK CANYON HIGHWAY, PHOENIX, ARIZONA 85015-5351 • P.O. BOX 29006, PHOENIX, ARIZONA 85038-9006 PHONE: (602) 240-6860 • FAX: (602) 240-6878 • WWW.AZWATER.COM

November 24, 2010

Mr. Tony Geiger US Pipe – Waterworks Marketing Consultants 34522 N. Scottsdale Road Scottsdale, Arizona 85226

Re: US Pipe Sentinel Fire Hydrants and Resilient Wedge Gate Valves

Dear Mr. Geiger:

Thank you for your interest in working with Arizona Water Company (the "Company") to add US Pipe Sentinel Fire Hydrants and Resilient Wedge Gate Valves to the Company's material and equipment specifications. Based on the US Pipe product information you provided and your field presentations to our operations and engineering staff, the Company is pleased to inform you that the following items are approved for use in the Company's water systems in Arizona.

Sentinel Fire Hydrant:

- Model Sentinel 250
 - 5¼" MVO
 - 4½" pumper
 - 2½" hose
 - Meets AWWA C-502 standard and approval by ULFM

Resilient Wedge Gate Valves:

- Model US Pipe A-USP0
 - Meets AWWA C-509 Full Body Cast Iron <u>includes</u> 304 SS Nuts, Bolts & Low Zinc Bronze Stem
 - Size range 2" thru 12"
- Model US Pipe A-USP1
 - Meets AWWA C-515 Reduced Wall Ductile Iron includes 304 SS Nuts, Bolts
 & Low Zinc Bronze Stem
 - Size range 14" thru 48"

To:

Tony Geiger - US Pipe

November 24, 2010

Subject:

US Pipe Sentinel Fire Hydrants and Resilient Wedge Gate Valves

Page 2

We look forward to developing a long-term relationship with you and the US Pipe products. If I can be of any assistance, please call me.

Very truly yours,

Fredrick K. Schneider

Vice President - Engineering

afh

VIA EMAIL: TGEIGER4@COX.NET



SPECIFICATIONS

GENERAL CONDITIONS OF CONTRACT: E-4-1

Construction Specifications: E-8-1

STANDARD SPECIFICATION DRAWINGS: E-9-1

2007 EDITION

GENERAL CONDITIONS OF CONTRACT: E-4-1

E-4-1

GENERAL CONDITIONS OF CONTRACT

DEFINITIONS

- A. <u>Company</u>. The words "Company" or "Arizona Water Company" mean Arizona Water Company, and where applicable, any division of Arizona Water Company, whose principal place of business is located at 3805 North Black Canyon Highway, Phoenix, Arizona 85015-5351 (Post Office Box 29006, Phoenix, Arizona 85038-9006).
- B. <u>Company's Authorized Representative</u>. The words "Company's Authorized Representative" mean any officer of the Company, and any of the Company's Engineers, any Division Manager or Superintendent of the Company and/or such other person(s) designated in writing as the "Company's Authorized Representative" by the President or any Vice President of the Company.
- C. <u>Contractor</u>. The word "Contractor" means either an individual or other entity employed to do the work as shown on the Construction Drawings and as specified herein.
- D. <u>Construction Drawings</u>. The words "Construction Drawings" mean plans prepared by or on behalf of Arizona Water Company.
- E. <u>Invitation to Bid.</u> The term "Invitation to Bid" means the current copy of Arizona Water Company's Form E-3-11-4 Request for Proposal/Contract or Form E-3-12-2 Invitation to Bid.
- F. <u>Contract</u>. The word "Contract" means the written document titled "Contract" or "Proposal/Contract" when such document has been signed by an officer or other authorized representative of both the Contractor and the Company.
- G. <u>Inspector</u>. The word "Inspector" means the Company's Authorized Representative or a person designated in writing by the Company's Authorized Representative.

GENERAL CONDITIONS OF CONTRACT

1. GENERAL

These General Conditions of Contract govern all works of installation and construction unless deviations are provided for on the Construction Drawings or in the Contract.

2. BONDS

The Contractor shall, upon request by the Company, furnish a performance bond and a material payment bond in the amount of 100% of the Contract price, in a form and from a surety acceptable to the Company.

3. LABOR AND/OR MATERIAL RELEASES

The Contractor shall supply labor and/or material releases satisfactory to the Company when requested to do so. Forms will be provided by the Company.

4. LICENSE

The Contractor shall have, as may be required by law, a valid license applicable to the work to be performed.

5. INSURANCE

The Contractor shall maintain in full force and effect insurance at no less than the following minimum amounts:

WORKER'S COMPENSATION	In accordance with requirements of the laws of the State of Arizona.
COMPREHENSIVE GENERAL LIABILITY (Including contractual liability covering death, bodily injury and property damage)	Combined single limit of not less than \$1,000,000 for each occurrence.
AUTOMOTIVE LIABILITY (Including owned, non-owned and hired vehicles)	Combined single limit of not less than \$1,000,000 for each occurrence.
SUBCONTRACTOR'S PUBLIC LIABILITY AND PROPERTY DAMAGE INSURANCE AND VEHICLE LIABILITY INSURANCE	Contractor shall either require each of its subcontractors to procure and to maintain Subcontractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance of the type and in the amounts specified in this Section 5 or insure the activities of its subcontractors in Contractor's own policy, in like amounts.

Such insurance shall name the Company, its officers, agents, and employees as additional insured and be primary for all purposes.

The Company will at all times have the right to require that all of such insurance be placed with insurance companies that are satisfactory to it. The Contractor shall file with the Company a certificate evidencing that each policy of insurance for the above coverages in the minimum amounts specified has been purchased and is in good standing.

Such certificate shall provide that notice be given to the Company at least thirty (30) days prior to cancellation or material change in the form of such policies or any of them. Such certificates shall be kept on file by the Company and the Company must have current certificates on file, or a certificate must accompany any bid proposal, before that proposal will be accepted by the Company.

6. CONTRACTOR UNDERSTANDS WORK AND WORKING CONDITIONS

By executing a Contract with the Company, the Contractor warrants that it has, by careful examination, satisfied itself as to the nature and location of the work, including soil conditions, the character, quality and quantity of the materials to be encountered, the character of the equipment and facilities needed preliminary to and during prosecution of the work, the general and local conditions, and all other matters which can in any way be expected to affect its work under the Contract. Verbal agreements or conversations with any officer, agent or employee of the Company, either before or after the execution of the Contract, are not binding upon the Company and shall not affect or modify any of the terms or obligations herein contained.

7. SPECIFICATIONS AND DRAWINGS

The Contractor shall keep on the job a complete copy of all drawings and specifications furnished by the Company which are applicable to the Contract with the Company. Anything mentioned in the specifications and not shown on the drawings or shown on the drawings and not mentioned in the specifications shall be of like effect as if shown or mentioned in both. In case of a discrepancy between the figures, drawings or specifications and physical conditions of the job, the matter shall be immediately submitted to the Company's Authorized Representative for decision as to adjustments, if any, because of the discrepancy; without a decision from the Company's Authorized Representative no discrepancy shall be adjusted by the Contractor, save only at its own risk and expense. Any deviation from the specifications must be approved in writing by the Company's Authorized Representative.

PROPERTY PROTECTION

Trees, fences, poles, underground structures and all other property shall be protected unless their removal is authorized on the Construction Drawings. Any property damaged shall be restored by the Contractor, at its expense, to the owner's satisfaction.

9. SPECIAL PERMITS, LICENSES AND INSURANCE

The Company shall obtain all permits for railroad, county, state, city and irrigation district rights-of-way as well as Forest Service, State Land Department and Bureau of Land Management permits. (Pipeline Contractors)

Whenever blasting is required, the Contractor shall obtain all permits, licenses and insurance required at its expense. (All Contractors)

The Contractor will be required to obtain, and shall certify in writing to the Company that it has obtained, all additional permits required to perform the work including, but not limited to, a National Pollution Discharge Elimination System Permit and/or an Aquifer Protection Permit as those permits relate to disposal of drilling, development and test waters and/or any other discharge or similar activity. (Well Drilling Contractors)

10. SURVEYS

The Company shall be responsible, or arrange, for all surveys required for the work covered in the Contract, unless otherwise specified.

11. BENCH MARKS, PROPERTY STAKES AND SURVEY STAKES

Bench marks, property stakes and survey stakes shall be preserved by the Contractor; in case they are destroyed or removed by Contractor or its employees, the Company will replace them at the Contractor's expense, and the Contractor and its sureties shall be liable therefore.

12. TOOLS, EQUIPMENT AND MATERIALS

The Contractor shall furnish all of the necessary tools, equipment, and pipeline materials required for the work. All material furnished by the Contractor shall be of the quality specified by the Company in its Construction Specifications (E-8-1).

SUPERINTENDENCE BY CONTRACTOR

The Contractor shall assure adequate superintendence of the work by a competent foreman or superintendent (with full authority to act on behalf of Contractor) satisfactory to the Company, who will be on the job at all times when work is in progress.

14. ORDER AND DISCIPLINE

The Contractor shall at all times enforce strict discipline and good order among its employees.

15. INDEPENDENT CONTRACTOR

The Contractor is an independent contractor and any provisions in the Contract, the specifications, or these General Conditions of Contract and Arizona Water Company's Construction Specifications which may appear to give the Company the right to direct the Contractor as to the details of the doing of any work to be performed by the Contractor, or to exercise a measure of control over said work, shall be deemed to mean and shall

mean, that the Contractor shall follow the desires of the Company in the results of the work only and not in the means whereby said work is to be accomplished, and the Contractor shall use its own discretion and shall have complete and authoritative control over the work and as to the details of the doing of the work.

16. PUBLIC SAFETY AND CONVENIENCE

Contractor shall at all times conduct its work so as to ensure the least possible obstruction to traffic and other inconvenience to the general public and the residents and businesses in the vicinity of the work, and to ensure the protection of persons and property.

To protect persons from injury and to avoid property damage, Contractor shall provide and maintain adequate barricades as required during the progress of the work and until it is safe to use the property for its intended purpose. The rules and regulations of the local governmental agencies and specific permit requirements respecting safety provisions shall be observed at all times.

In the case of blasting, the Contractor shall exercise extreme caution to protect the general public and personal and public property from harm or damage.

17. PROPERTY PROTECTION

Trees, fences, poles, and all other property shall be protected unless their removal is authorized by the Company. Any property damaged shall be restored by Contractor, at his expense, to Company's satisfaction.

18. RESPONSIBILITY OF CONTRACTOR

The work shall be under Contractor's responsible care and charge. Contractor shall bear all loss and damage whatsoever and from whatsoever cause, except that caused solely by the act of Company, which may occur on or to the work during the fulfillment of the Contract. If any loss or damage occurs, Contractor shall immediately make good any such loss or damage, and in the event of Contractor refusing or neglecting to do so, Company may, or by the employment of some other person, make good any such loss or damage, and the cost and expense of so doing shall be charged to Contractor.

The mention of any specific responsibility or liability imposed upon Contractor shall not be construed as a limitation or restriction of any general liability or duty imposed upon Contractor by the Contract. The reference to any specific duty or liability being made herein is merely for the purpose of explanation.

Contractor alone shall at all times be responsible for the safety of Contractor, Contractor's employees, and its subcontractors' employees, and for Contractor and its subcontractors' plant and equipment and the method of performing the work.

19. ERRORS AND OMISSIONS

If Contractor, in the course of the work, becomes aware of any errors or omissions in the Contract Documents or in the instructions, or if Contractor becomes aware of any discrepancy between the Contract Documents and the physical conditions of the site of

the work, Contractor shall immediately inform Company in writing. Any work done by Contractor after such discovery, until authorized by Company, will be done at Contractor's risk.

20. LAWS, REGULATIONS

Contractor shall give all notices required by law and comply with all laws, ordinances, rules and regulations, including, but not limited to, all applicable federal, state, local and other legally required health and safety standards, orders, rules, regulations or other laws, pertaining to the conduct of the work. Contractor shall be liable for, and shall defend and indemnify Company against and hold it harmless from, all violations of any law, ordinance, rule, regulation, standard, or order in connection with work furnished by or on behalf of Contractor. If Contractor observes that the Contract Documents are at variance with any law, ordinance, rule, regulation, standard, or order it shall promptly notify Company in writing and any necessary changes shall be adjusted as provided in the Contract for changes in the work. Contractor shall not perform any work contrary to such laws ordinances, rules, regulations, standards, or orders.

21. PERMITS, FEES AND INSPECTIONS

Permits and licenses necessary for the prosecution of the work, including, but not limited to, any National Pollution Discharge Elimination Systems (NPDES) Permits required by U.S. Environmental Protection Agency or the Arizona Department of Environmental Quality shall be secured, paid for, and complied with by Contractor.

Contractor shall be responsible for its actions and shall abide by all conditions and/or restrictions set forth in the NPDES Permit and any other permit or license required for this project.

Company shall at all times have access to the work whenever it is in preparation or in progress and Contractor shall provide proper facilities for such access and for all inspections. If the Contract Documents, the General Superintendent's instructions, laws, ordinances or any public authority require any work to be inspected or approved, Contractor shall give timely notice of its readiness for inspection.

Inspection of the work shall not relieve Contractor of any of its obligations even if defective work or unsuitable materials may have been previously overlooked by Company and accepted or estimated for payment. If any work is found not in accordance with the Contract Documents, Contractor, at its sole cost and expense, shall promptly make good such defective work.

22. CONSTRUCTION MARKING (PIPELINE ONLY)

Each job shall be marked and/or barricaded by the Contractor in such a manner that the construction is clearly visible at all times.

23. EXTRA WORK AND/OR MATERIALS

Except as otherwise herein provided, no charge for any extra work and/or material will be allowed unless the same has been ordered in writing by the Company's Authorized Representative, and the price stated in such order.

24. CHANGES

The Company shall have the right to make any changes in the work that it may determine to be necessary. If such changes affect the cost of the work, an equitable adjustment shall be negotiated. Changes shall in no way affect or void the obligations of both parties under the original Contract.

25. INSPECTION

All work and material shall be open at all times to inspection and acceptance or rejection by the Company's Inspector. Any work covered up by the Contractor prior to inspection and acceptance by the Company shall be subject to being uncovered at the expense of the Contractor for inspection by the Company. The Contractor shall give the Company reasonable notice of starting new work and shall provide, without extra charge, reasonable and necessary facilities for inspection, even to the extent of taking out portions of finished work. In case any such finished work removed is found satisfactory, however, the actual direct cost of such removal and replacement, plus 15% of such cost, will be paid by the Company; in addition, if completion of the work has been delayed thereby, the Contractor shall be granted a suitable extension of time on account of the additional work involved.

26. DEFECTIVE WORK OR MATERIAL

The Contractor shall remove, at its own expense, any work or material found defective by the Company's Inspector and shall rebuild and replace the same without extra charge; in default thereof, the same may be done by the Company at the Contractor's expense.

27. ASSIGNMENT

Neither party to the Contract may assign the Contract or sublet it in whole or in part without the written consent of the other, nor shall the Contractor assign any monies due or which may become due hereunder without the previous written consent of the Company, nor shall such consent release the Contractor from any of its obligations and liabilities under the Contract.

28. RIGHTS OF VARIOUS INTERESTS

Whenever work that is being done for the Company other than by the Contractor is contiguous to work being done by the Contractor, the respective rights of the various interests involved shall be established by the Company to secure the completion of the various portions of the work in general harmony.

29. SUSPENSION OF WORK

The Company's Authorized Representative may at any time and for any reason suspend all or any portion of the work under the Contract. This right to suspend work shall not be construed as denying the Contractor compensation for actual, reasonable and necessary expenses due to suspension to which it may be entitled.

The Company's Authorized Representative may order the Contractor to suspend any work because of certain conditions, such as inclement weather, or because the

Contractor is in violation of these General Conditions of Contract or the Construction Specifications. It is understood that compensation for expenses will not be allowed for such suspension when ordered by the Company's Authorized Representative on account of such conditions.

30. PROCEDURE OF WORK (PIPELINE ONLY)

All work under the Contract shall be planned and performed so as to cause a minimum of interference with normal vehicular and pedestrian traffic. At no time shall the Contractor completely obstruct the traffic to any business establishment during normal work hours of that business. It shall be the Contractor's responsibility to maintain facilities for ingress and egress to any business establishment. When crossing any street, not more than one-half of the street may be blocked at one time. All federal, state, county and city laws, rules and regulations relating to this subject are to be obeyed.

The Contractor shall complete any portion or portions of the work in such order of time as the Company may require. The Company shall have the right to take possession of and use any completed or partially completed portions of the work. If such prior possession or use increases the cost of or delays the work, the Contractor will be entitled to extra compensation or extension of time or both, as the Company may determine.

31. DISPUTES

All questions or controversies which arise between the Contractor and the Company, under, or in reference to, the Contract, shall be decided by the Company's Authorized Representative and a representative of the Contractor, and their decision shall be final and conclusive upon both parties.

32. CONNECTION TO EXISTING SYSTEM (PIPELINE ONLY)

Unless approved in writing by the Company's Authorized Representative, no tie-in or hot tap on the existing system shall be made unless the Company's Inspector is present. When the tie-in requires the operation of an existing valve or other control equipment, the conditions of Paragraph(s) 30 and 33 shall be complied with. The Contractor shall notify the Company twenty-four (24) hours prior to tie-in as to the exact time the Contractor plans to make tie-in so that the Company's Inspector will have sufficient time to locate valves and make necessary preliminary arrangements for shut down.

33. PLANNED INTERRUPTION OF WATER SERVICE (PIPELINE ONLY)

No valve or other control on an existing Company water system shall be operated for any purpose by the Contractor without approval of the Company's Inspector. All of the Company's water customers whose service is interrupted by a planned interruption, other than in cases of emergency, shall be notified by the Contractor at least twenty-four (24) hours before the planned interruption and advised of the probable time when the service will be restored.

34. EXISTING UTILITY FACILITIES (PIPELINE ONLY)

The Contractor shall notify all known utilities in the area of the work to be performed under the Contract and shall make arrangements to have their facilities marked in

accordance with A.R.S. ?40-360.022 ("Blue Stake Law"). The Contractor shall be responsible for locating and preserving all marked facilities. Any damages to these marked facilities shall be repaired at the expense of the Contractor.

The Company will pay the cost to relocate its or other structures when such structures are found occupying the physical space of the proposed installation. It is understood that the Contractor will be reimbursed for such work only when written authorization from the Company has been obtained in advance of such work.

35. CLEANING UP

The Contractor shall remove from the Company's property and from all public and private property, at its own expense, all temporary structures, rubbish and waste materials resulting from its operations. In the event Contractor fails to do so, the Company may remove same at the expense of the Contractor.

36. WORKING HOURS (PIPELINE ONLY)

Unless stated to the contrary in the Invitation to Bid and/or so stated on the Construction Drawings, or agreed to by the Company during a Pre-Construction Conference, the Contractor shall not be permitted to perform work on Saturdays, Sundays, or Company holidays, or commence work such as tie-ins that cannot be completed during normal working hours.

37. INDEMNITY

- The Contractor shall indemnify the Company against, and save and hold it harmless from, any and all liability, claims, demands, loss, actions, causes of action, expense, penalties, fines, assessments, damages and costs of every kind and nature for injury to or death of any and all persons, including, without limitation, employees or representatives of the Company or of the Contractor or of any subcontractor, or any other person or persons, and for damage, destruction or loss, consequential or otherwise, to or of any and all property, real or personal, including, without limitation, property of the Company or of the Contractor or of any subcontractor, or of any other person or persons, and the violation of any law, ordinance, rule, regulation, standard, or order resulting from or in any manner arising out of or in connection with the performance of the work under the Contract, howsoever same may be caused, including, without limitation, the Company's active or passive negligence. The Contractor shall also, upon request by the Company, and at no expense to the Company, defend the Company in any and all suits, concerning such injury to or death of any and all persons, and concerning such damage, destruction or loss, consequential or otherwise, to or of any and all property, real or personal, including, without limitation, suits by employees or representatives of the Company or of the Contractor or of any subcontractor, or any other person or persons. or concerning any court or administrative proceeding concerning the violation of any law, ordinance, rule, regulation, standard, or order. Excluded from this paragraph are only those injuries to or deaths of persons and damage, destruction or loss, to or of property arising from the sole negligence or willful misconduct of the Company.
- B. Contractor shall indemnify the Company against, and save and hold it harmless from, any and all liability, claims, demands, damages, costs, expenses and attorney's fees, suffered or incurred on account of any breach of any obligation, covenant or other

provision of this contract, including without limitation, breach of the indemnity provisions of subsection A of this Section 37.

C. Contractor further agrees to defend, indemnify and hold harmless the Company, its directors, officers, employees, and agents, from and against any and all costs, damages, claims, expenses, violations, notices of violations, penalties, liens, assessments, and liabilities of every kind and nature, foreseeable or unforeseeable, directly or indirectly, arising from any release, removal, generation, use, storage or disposal on, under, around, or from the well site of any material, substance, or waste, hazardous or non-hazardous, including, without limitation, drilling fluids, mud, cuttings and development and test water howsoever same may be caused, including, without limitation, the Company's active or passive negligence.

38. LIENS

If at any time there shall be evidence of any lien or claim for which the Company might become liable and which is chargeable to the Contractor, the Company shall have the right to retain out of any payment then due or thereafter to become due, an amount sufficient to completely indemnify the Company against such lien or claim. If the Company determines that such lien or claim is valid, the Company may pay and discharge the same, and deduct the amount so paid from any monies which may be or become due and payable to the Contractor.

39. PAYMENT

Upon completion of the installation or construction, the Company will, within thirty (30) days after receipt of proper invoice and labor and material releases, pay the amount due the Contractor. If the Company believes that additional work, such as clean up, is required, it may deduct the total cost of such additional work from the amount to be paid to Contractor.

40. COMPANY'S RIGHT TO TERMINATE CONTRACT: DAMAGES DUE TO DELAY

If the Company finds the Contractor to be in material violation of any section of these General Conditions of Contract, Construction Specifications or Standard Specification Drawings or if the Contractor refuses or fails to prosecute the work, or any separable part thereof, with such diligence as will insure its completion within the time specified or any extension thereof, or fails to complete said work within such time, or when any other cause exists to justify such action, the Company may, without prejudice to any other right or remedy, by written notice to the Contractor, terminate its right to proceed with the work or such part of the work as to which there has been such violation, delay or other cause.

In the event the Contractor's right to proceed is terminated, the Company may take over the work and take possession of, and utilize in completing the work, such materials as may be on the site of the work and necessary therefore and prosecute said work to completion by whatever method it may deem expedient. The Contractor and its sureties shall be liable to the Company for any excess cost caused thereby.

In the event the Contractor's right to proceed with the work is terminated, the Contractor shall not be entitled to receive any further payment until the work is completed or the job is canceled. If the unpaid balance of the Contract price exceeds the expense of finishing

the work, including compensation for additional managerial and administrative services, such excess shall be paid to the Contractor. If such expenses exceed such unpaid balance, the Contractor shall pay the difference to the Company.

41. GUARANTEE

The Contractor shall guarantee all deslabor and workmanship and any materials it installs for a period of one year following the date of completion and acceptance by the Company. If any portion of the work or any of the materials become defective within the guarantee period, the Company will notify the Contractor of such defect. The Contractor must repair any defect within fifteen (15) days of such notification. If repairs are not completed within this time period, the Company may repair the defect, or cause such defect to be repaired, and the cost of such repairs shall be paid by the Contractor. The Company reserves the right to determine which defects are the result of poor labor and workmanship and which are caused by defective materials.

42. <u>LIQUIDATED DAMAGES FOR NON PERFORMANCE: REQUEST FOR EXTENSION(S) OF TIME</u>

Time is of the essence in the Contract. The time period required for completion of the work will be specified in the Contract. The Contractor agrees that the Company will suffer substantial damages in the event the Contractor fails to complete the work within the agreed upon time period. The Contractor and the Company agree that since it would be impracticable or extremely difficult to precisely fix such damages, a reasonable approximation of such actual damages suffered by the Company shall be a sum equal to 0.5% of the Contract price for each working day beyond the time period for completion of the work specified in the Contract.

Request by the Contractor for extensions of the time period shall be in writing and shall not become effective until approved in writing by the Company's Authorized Representative.

43. PAYMENT FOR REQUIRED TESTING

Whenever testing is required by any governmental agency or by the Company to assure conformance of the Contractor's work with the appropriate standard, it will be paid for as follows:

- a. For testing required under permits obtained by the Company or testing specifically requested by the Company, the cost of the first test will be paid for by the Company. In the event of failure of the first test, the cost of all further testing associated with the failure will be paid by the Contractor.
- b. For testing required under permits obtained by the Contractor, all costs will be paid by the Contractor. Testing of the pipeline for pressure and leakage will be included in the Contract price.

44. CONTRACT DEADLINES AND BONDS REQUIREMENTS

The time limits to be allowed for the completion of any work covered in the Contract shall be established as follows: In the proposal submitted to the Company, in response to the Invitation to Bid, the Contractor shall state the number of calendar days required for completion of the work. The time required will become a part of the Contract. When the Company is ready to proceed with the work, a Commencement Notice will be issued by the Company to the Contractor by mail. The Commencement Notice will allow the time required in the Contract plus ten (10) calendar days and will indicate the final day of the time allowed. The work cannot begin until the Company has received a performance bond and materials payment bond for the Contract price unless the bonds have been waived under the special conditions section of the Contract. The additional ten (10) days is the allowance for time to deliver the Commencement Notice to the Contractor and for the Contractor to return the performance bond and materials payment bond to the Company. Time extensions will be granted if warranted, and only at the time of the delay, thus extending the final day of the time allowed.

If the Company elects not to require a performance bond and a material payment bond for the work, the cost of the bonds will be deducted from the proposed total cost and the Contract will reflect this reduced cost and the bonds requirements will be waived under special conditions of the Contract.

CONSTRUCTION SPECIFICATIONS: E-8-1

E-8-1

CONSTRUCTION SPECIFICATIONS FOR THE INSTALLATION OF WATER DISTRIBUTION SYSTEMS DUCTILE IRON

DEFINITIONS

- A. <u>Company</u>. The words "Company" or "Arizona Water Company" mean Arizona Water Company, and where applicable, any division of Arizona Water Company, whose principal place of business is located at 3805 North Black Canyon Highway, Phoenix, Arizona 85015-5351 (Post Office Box 29006, Phoenix, Arizona 85038-9006).
- B. <u>Company's Authorized Representative</u>. The words "Company's Authorized Representative" mean any officer of the Company, and any of the Company's Engineers, any Division Manager or Superintendent of the Company and/or such other person(s) designated in writing as the "Company's Authorized Representative" by the President or any Vice President of the Company.
- C. <u>Contractor</u>. The word "Contractor" means either an individual or other entity employed to do the work as shown on the Construction Drawi ngs and as specified herein.
- D. <u>Construction Drawings</u>. The words "Construction Drawings" mean plans prepared by or on behalf of Arizona Water Company.
- E. <u>Contract</u>. The word "Contract" means the written document titled "Proposal/Contract" when such document has been signed by an officer or other authorized representative of both the Contractor and the Company.

CONSTRUCTION SPECIFICATIONS FOR THE INSTALLATION OF WATER DISTRIBUTION SYSTEMS DUCTILE IRON

1. GENERAL

All work is to be completed in a safe, workmanlike manner and in accordance with these Construction Specifications; any deviation therefrom must be approved in writing by the Company.

Installations must conform with the requirements of all governmental regulating agencies and the cost of conforming to such regulations must be included in the unit bid prices. Examples of such regulations, wi thout attempting to be inclusive, are:

- a. Special compaction and paving for street crossing.
- b. Shoring when required because of the trench depth.
- Closing a trench in those areas where no open trench is allowed overnight.
- d. Barricading and traffic control as required.

2. LOCATION MARKING

Alignment stakes as required in the opinion of the Company shall be furnished by the Company to the Contractor and shall be set by the Company at agreed upon intervals and offsets. Under normal circumstances these will reference the pipeline location five feet (5') into the right-of-way measured from property pins. Grade stakes will be provided only when the Construction Drawings show a pipeline depth other than covered in these Specifications. It is the responsibility of the Contractor to preserve all survey work.

3. TRENCH EXCAVATION

The trench location is to be determined by the Construction Drawings.

FOR 8-INCH OR SMALLER PIPE: The depth of the trench prior to pipe laying shall be such that the finished pipeline shall have between thirty-six inches (36") and forty-two inches (42") of cover unless otherwise specified on the Construction Drawings.

FOR 12-INCH AND LARGER PIPE: The depth of the trench prior to pipe laying shall be such that the finished pipeline shall have between forty-eight inches (48") and sixty inches (60") of cover unless otherwise specified on the Construction Drawings.

The width of the trench at and below the level at the top of the pipe shall be a minimum of twelve inches (12") plus the outside diameter of the pipe barrel and a maximum of twenty-four inches (24") plus the outside diameter of the pipe barrel.

The bottom of the trench shall be accurately graded to provide a uniform bearing for each length of pipe for the full length of the pipe. If the native material on the trench bottom can be reasonably dug by hand, bell holes shall be dug for the joints so that the joints in no way support the pipe. When native materials such as rock are encountered during trenching that will not provide a uniform support for the pipe, the trench will be over-excavated an additional six inches (6") and suitable bedding m aterial will be placed in the trench.

Bedding material will be placed by hand in four-inch (4") lifts and compacted to ensure uniform compaction and to eliminate any voids under the pipe. When the space between the pipe and trench bottom varies, this must be backfilled and compacted in four-inch (4") lifts to the mid-section of the pipe.

Whenever the trench is over-excavated for whatever reason, the trench bottom will be brought up to the correct depth at the Contractor's expense using either method (a) or (b) as follows:

- a. A.B.C. material shall be used and compacted to a uniform density of not less than 80% of the maximum density as determined by AASHTO T-99 method A and T-191.
- b. Native material 100% of which will pass through a one and one-half inch (1½") screen and at least 20% of which will pass through a number-8 screen shall be used and compacted to a uniform density of not less than 85% of the maximum density as determined by AASHTO T-99 method A and T-191.

4. MATERIALS TO BE PROVIDED BY CONTRACTOR

Unless otherwise specified on the Construction Drawings or in the Contract, the Contractor will supply all of the necessary materials which will become a permanent and integral part of the water distribution system, including concrete blocking, anchors, backfill material, paving material and supplies used during the prosecution of the work. All materials provided by the Contractor to construct the water distribution system must be NSF Standard 61 approved. All potable water pipes and fittings shall have NSF-PW seal. Construction materials used in the water system shall be lead free as defined at AAC R28-4-504 and R18-1-101. The Contractor will provide the following materials:

- a. FIRE HYDRANTS: Mueller Super Centurion 250 Fire Hydrant, meets ANSI/AWWA C502 Standard, Model No. A-423, 5¼" main valve opening, three way, 6" Mechanical Joint Shoe, 1½" pentagon operating nut, color yellow, drain open, open direction left, 4' or 4'6" bury depending on application. For pumper and hose nozzle information see below.
 - (1) 1 4" Pumper Nozzle, NST and 2 2½" Hose Nozzles, NST. (These locations only: Ajo, Casa Grande, Coolidge and San M anuel.)
 - (2) 1 4½" Pumper Nozzle, NST and 2 2½ " Hose Nozzles, NST. (These locations only: Apache Junction, Arizona City, Lakeside, Oracle, Overgaard, Pinewood, Rimrock, Sedona, Sierra Vista, White Tank and Winkelman.)
 - (3) $1 4\frac{1}{2}$ " Pumper Nozzle, NST and $2 2\frac{1}{2}$ " Hose Nozzles, NPT (Bisbee only.)
 - (4) 1 3" Pumper Nozzle GA 6-350 (6 threads per inch, 3.50 pitch diameter) and $2 2\frac{1}{2}$ " Hose Nozzles, NPT (Miami only.)

- (5) $1-3\frac{1}{2}$ " Pumper Nozzle GA 6-411 (6 threads per inch, 4.11 pitch diameter) and $2-2\frac{1}{2}$ " Hose Nozzle, NST (Superior only.)
- b. FITTINGS: Manufactured by Tyler or Union. Crosses, Elbows, Tees, Cap, Reducer, Adapter, Plug, Blind Flange and Tapped Flange; Ductile Iron, Class 350, SSB, Cast Iron Cement Lined.
 - (1) Foster Adaptors for MJ, made by Infact Corporation: Available in size 4" to 16". Part No. 4" = 4FA-BC, 6" = 6FA-BC, 8" = 8FA-BC, 10" = 10FA-BC, 12" = 12FA-BC, 16" = 16FA-BC.
- c. DETECTOR CHECK VALVE: Mueller/ Hersey EDC III, iron body, including 5/8" x 3/4" Trim Kit. Trim Kit Part No.: 4" = 282080, 6" = 282082, 8" = 282085, 10" = 282496.
- d. GATE VALVES: Mueller Resilient Wedge Gate Valves, meets AWWA C509 specification, 250 psig, Non-rising stem, Part No. A-2360 sizes 4" through 12"; Part No. A-2361 sizes 14" through 36", low zinc stems, epoxy coated inside and outside to meet the NSF 61 rating. The bonnet and stuffing box shall have 304 stainless steel bolts/nuts.
- e. TRACER WIRE and WARNING TAPE:
 - TRACER WIRE: Shall be direct bury AWG #14 solid copper wire, Color: Blue.
 - 2. WARNING TAPE: Reef Industries, Standard Terra Tape in 3" widths. Color: Blue and imprinted 'Arizona Water Company'.
- f. AIR RELEASE VALVE: Crispin Model AR10 with 1" NPT inlet and ½" NPT outlet, cast iron body and top flange; with a 5/64" orifice with stainless steel valve sealing faces and B UNA-N rubber.
- g. PRESSURE RELIEF VALVE: Watts 174A, Model M, 2" inlet, 2" outlet, Bronze Body, 30lb. to 150lb. pressure range.
- h. MEGA LUG: Mechanical Joint restraint made of ductile iron conforming to ASTM 536-80, 250 psi made by EBAA Iron, Inc., series 1100 or equal.
- i. METER BOXES:
 - (1) Concrete Box with a steel regular lid, Number 1: Tucson specification.
 - (2) Concrete Box with a steel regular lid, Number 2, 3, and 4: Phoenix specification.
- j. PIPE, COPPER: Type K soft copper in 60 or 100-foot coils, per ASTM B88.
- k. PIPE, DUCTILE IRON: Ductile Iron Pipe, Cement Lined, Push-on, conform to current ANSI/AWWA Specification A21.51/C151, Pressure Class 350 (sizes 4" through 12"), Pressure Class 250 (sizes 14" through 20"), or Pressure Class 200 for 24" through 36" pipe. Vendors:

- (1) Pacific States Cast Iron Pipe Company
- (2) Griffin Pipe
- (3) United States Pipe and Foundry Company
- (4) American Ductile Iron Pipe
- (5) Clow Pipe (McWane, Inc.)
- PIPE, PLASTIC: Plastic pipe, C-900 PVC per ANSI/AWWA C900, Class 150, sizes 6" through 12". NSF61 approved. Furnished in laying lengths of 20'. The barrel shall conform to the outside dimensions of steel pipe (IPS) or cast iron (CI) pipe equivalent and the wall thickness of dimension-ratio (DR) 18.
- m. POLYETHYLENE ENCASEMENT (Polywrap): For all pipeline and related fittings installed, EXCEPT for the Coolidge Division. Minimum 8 Mil. and installed per AWWA C105/A21.5-93 and ASTM A-674-89. Manufactured by the Pacific States Cast Iron Pipe Company. The wrapping tape shall be minimum 10 mil. vinyl tape. No duct tape shall be used.
- n. COUPLING: Mueller, straight three part union, tested to meet ANSI/AWWA C800, H15403, conductive compression.

Mueller, H15428, straight coupling, conductive compression by male iron pipe, tested to meet ANSI/AWWA C800 specification. Size: 2".

Mueller, H15451, straight coupling, conductive compression by female iron pipe, tested to meet ANSI/AWWA C800 specification. Size: 2".

Viking Johnson brand, sold by Mueller: MaxiFit Straight (2"-24"), MaxiFitXtra Straight (4"-8") or MaxiStep Transition, tested to meet AWWA/ANSI C.219-91 specifications – certified to ISO 9001:1994 / Smith – Blair Quantum.

o. STOP, ANGLE METER, BALL: Mueller, valve, B24258, conductive compression by meter swivel nut, tested to meet ANSI/AWWA C800, size 5/8 " x ¾" x ¾" for a ¾" service or size 1" for a 1" service.

Mueller, valve, B24265, female pipe thread by meter swivel nut, tested to meet ANSI/AWWA C800, size 5/8" x $\frac{3}{4}$ " for a $\frac{3}{4}$ " service or size 1" for a 1" service.

p. STOP, CORP: Mueller, ball valve, B25008, taper thread by conductive compression, tested to meet ANSI/AWWA C800 specification, sizes: ¾", 1" and 2".

Mueller, ball valve, B25028, iron pipe thread by conductive compression, tested to meet ANSI/AWWA C800 specification. Sizes ¾", 1", and 2".

Mueller, 300 Ball Curb Valve, B-25122, taper thread by conductive compression, tested to meet ANSI/AWWA C800 specifications, size: 2". (2" service)

- q. STOP, CURB: Oriseal valve, H10291, iron pipe thread by iron pipe thread, quarter turn check, brass, tested to 300 psi working pressure, tested to meet ANSI/AWWA C800 specification, size: 2".
 - Mueller, B20283, Mueller 300 ball curb valve, female iron pipe by female iron pipe, quarter turn check, tested to meet ANSI/AWWA C800 specification. Size: 2". (Blow-off E-9-8-1).
- r. TAPPING SADDLE: Smith Blair, Cast Bronze ASTM-B584 85-5-5-5, double strap, iron pipe threads, Models 321 and 323. Washers are silicon bronze, ASTM-B36. Gaskets are grade 60 Buna N, or Mueller bronze double strap service saddle, BR 2 B series, cast bronze, ASTM-B585, 85-5-5-5, or H16084, 200 psig, meets ANSI/AWWA C800.
- s. TAPPING SLEEVE: Mueller H304 Stainless Steel Tapping Sleeve, JCM 432 18-8 Type 304 Stainless Steel Tapping Sleeve, Romac "SST" Type 304 Stainless Steel Tapping Sleeve or CASCADE-style CST-EX stainless steel pressure-rated tapping sleeve.
- t. TAPPING VALVE: Mueller Resilient Wedge tapping valve, Catalog Number T-2360-16, Class 125, sizes 4" through 12"; T-2361-16, Class 125, sizes 14" to 36" all with Type 304 stainless steel fasteners; bypass valves are required on 18" 36" valves flange by mechanical joint per ANSI/AWWA C111, iron wedge, non-rising stem. Epoxy coated interior/exterior per ANSI/AWWA C550 for NSF 61 compliance. 250 PSI range for valves 4" to 12". 150 PSI range for valves 14" to 36".
- u. U-BRANCH: Mueller, H15364, 1" male iron pipe by ¾" male iron pipe, tested to meet ANSI/AWWA C800 specification. Size: 1" x ¾" x 13½", straight line.
- v. VALVE BOXES: Valve Box with Cover, adjustable, Tyler 562-A or equal, made of cast iron.
- w. VAULTS: Utility Vault Company, Chandler, AZ.
 - (1) 4484-WA concrete vault with a 3660 aluminum double torsion door with a recessed padlock hasp, two 18" x 24" center knockouts.
 - (2) 575-WA concrete vault with a 4874 aluminum double torsion door with a recessed padlock hasp, two 18" x 24" center knock outs and adjustable frame.
 - (3) 612-5X-WA concrete vault with a 4874 aluminum double torsion door with a recessed padlock hasp, two 18" x 24" center knockouts.
- x. VALVE, METER: Mueller, B24265-1, Mueller 300 ball angle meter valve, female iron pipe by meter nut, quarter turn check, lock wing, tested to meet ANSI/AWWA C800 specification. Size: 1".

Mueller, B25170, Mueller 300 ball straight valve, conductive compression by female iron pipe, quarter turn check, lock wing, tested to meet ANSI/AWWA C800 specification. Size: 1".

y. YOKES, METER: Relocator type copper meter yoke with horizontal inlet and outlet and meter thread ends, B24118, with lock wing Mueller 300 angle ball valve, full port, sizes: 1" x 12", 5/8" x ¾" x 7", 5/8 x ¾" x 9".

Mueller, 2" copper meter yoke with horizontal inlet and outlet and female iron pipe threads, B2423-99000, with lock wing Mueller 300 ball angle meter valves on inlet and outlet risers. Raised 1" by-pass with lock wing Mueller 300 ball valve.

The Contractor also will be required to provide the following materials, the cost of which will be included in its unit bid price:

All material and concrete for thrust blocks, other anchors, reinforcing steel; all gravel, crushed stone, A.B.C., earth, sand, or screened material which may be required; all material for bracing and shoring trenches and for construction of forms; all barricades and traffic control equipment; all material for paving replacement and any water used for compaction of backfill.

5. INSTALLATION OF MATERIALS

All materials are to be installed in accordance with manufacturers recommendations unless otherwise directed by these S pecifications.

All pipe, fittings and valves shall be laid true to the lines, grades and locations established by the Specifications and the Construction Drawings.

The ends and inside of the pipe shall be thoroughly cleaned and inspected for damage. No damaged materials shall be installed in the water distribution system.

Whenever the work ceases for any reason, all open pipeline ends shall be tightly plugged by the Contractor. Plugs shall be watertight and approved by the company.

Concrete thrust blocks of the sizes required by the plans and specifications are to be provided at all valves, changes in direction or size, or at any other point where an unbalanced thrust due to water pressure would exist. Thrust blocks are to be formed to prevent any concrete from spilling over or into a joint.

Trench curves as shown on the Construction Drawings may be made without fittings when using push on joint pipe up to twelve inches (12") in diameter, if the deflection of the pipe does not exceed five degrees (5°) or nineteen inches (19") per eighteen-foot (18') length of pipe. The minimum radius of such curves will be two hundred five feet (205').

Prior to construction, the appropriate agency(ies) will be notified as required by the permit(s).

It shall be the Contractor's responsibility to uncover all existing water lines being connected to, and to verify the location, depth and size of pipe befor e any construction begins.

Any construction performed without the knowledge of the duly authorized representative is liable for removal and replacement at the Contractor's expense.

All fire hydrants, frames, covers and valve boxes, etc. shall be adjusted to finished grade prior to the placing of the asphalt concrete surface course by the Contractor (where applicable).

Air release valves shall be installed at water system high points per Standard Detail E-9-8-2.

All water services shall be set a minimum of two feet (2') on the customer's property, preferably within the P.U.E. and not within right-of-way.

Unless otherwise specified on the construction drawings, all water mains shall be installed five feet (5') from the property line inside the right-of-way or easement.

Water valves shall be spaced not more than five hundred feet (500') in commercial districts and not more than eight hundred feet (800') in other districts. Variations may be required for transmission mains or special applications.

Installation of water line casing shall be per Standard Speci fication E-9-24-1.

Tracer Wire and Warning Tape are to be installed on all mains, tees, crosses, ells and fire hydrant laterals. They will not be installed on service lines. The tracer wire will be installed on the water main 45 degrees from the vertical centerline of the pipe and shall be taped to the fittings directly and on the main every 10 feet using a minimum 10 mil vinyl tape. The tracer wire shall be placed between the valve riser and box with a minimum of 12" of wire inside. The warning tape shall be installed a minimum of two feet below the surface, being measured from final grade, directly over the center of the pipe. Any splices in the tracer wire shall be joined using waterproof connectors. Any splices in the warning tape shall be joined using minimum 10 mil vinyl tape. The tracer wire shall be tested for continuity after backfill and compaction, but before paving. Any detected damages to the wire shall be repaired before paving will be allowed.

6. BACKFILL OF WATER MAIN TRENCHES

Backfill of any excavation shall conform to the requirements of any of the governmental agencies having jurisdiction over the location. If no governmental agency having such jurisdiction specifies backfill or compaction requirements, and no special requirements are shown on the Construction Drawings, the procedure set forth in this section will apply for water line trenches.

The bedding material above the pipe and backfill material shall be compacted to a minimum of 70% compaction within a utility easement and 80% compaction within a right-of-way as determined by AASHTO T-99 method A and T-191. If water settling is used for compaction, it is the responsibility of the Contractor to prevent the pipe from floating.

The bedding material shall be either native material, 100% of which will pass through a one and one-half inch ($1\frac{1}{2}$ ") screen and at least 20% of which will pass through a number-8 screen, or imported material which conforms to M.A.G. specifications for A.B.C. or type-B

select materials. Bedding material shall be used below and around the pipe and a minimum of twelve inches (12") above the pipe. Shade and bedding material to be mechanically compacted prior to remainder of trench back-fill.

The remainder of the trench shall be backfilled with native or imported material which shall be of sound earthen material free from broken concrete, wood, broken pavement, or other unsuitable substances. Except as otherwise specified, backfill may be material containing no pieces larger than six inches (6") in greatest dimension.

Where settlement occurs, additional backfill material shall be placed and compacted and the trench shall be brought to final grade.

7. HYDROSTATIC TESTING OF COMPLETED PIPELINES

Hydrostatic testing of water pipelines will be completed before the new system is connected into the existing water system so that all testing can be done against all new materials.

The completed section of water pipeline to be tested shall be slowly filled with water with care being taken to expel all air from the pipe. If necessary, the pipe will be tapped at high points to vent air.

The Contractor shall provide all equipment and labor necessary to accomplish this testing and the price shall be included in the unit prices. The Contractor shall notify the Company in advance of the testing so that the Company can schedule a duly authorized representative to be at the site during testing. The Contractor, at its own expense, shall make any necessary repairs to the system being tested in order to cause the section being tested to meet the test limits set below. The Contractor may request authorization of the Company to connect the new pipelines to the existing system prior to completion of pressure testing when, in the Company's sole opinion and judgment, conditions warrant such connection.

The Contractor shall assume all responsibility to complete pressure testing to Company's specifications after such connection, including, but not limited to, isolation of the new pipelines from the existing system, if necessary.

Connections prior to completion of pressure testing shall not be made unless prior Company authorization has been obtained, and any extra expenses resulting from such connections shall be the sole responsibility of the Contractor.

Leakage tests will be for a period of two hours at 200 ± 5 psi at the point of lowest elevation; leakage may not exceed 0.1 gallons per hour per one thousand feet (1,000') of pipe per inch of diameter. If dry utilities are not installed, a second pressure test is required.

8. STERILIZATION AND FLUSHING OF COMPLETED WATER PIPELINES

Sterilization and flushing will conform to recommendations of Arizona State Department of Health Services Engineering Bulletin Number 8, latest edition, or any future Arizona Department of Environmental Quality bulletins. Contractor to follow all conditions of any discharge permit.

NO OTHER UTILITIES ALLOWED IN OR NEAR WATER PIPELINE TRENCHES

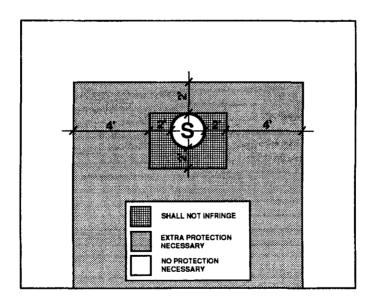
No other utility installations will be permitted in the water pipeline trench or within five feet (5') of the Company's water pipeline when running parallel to the water pipelines.

10. PROTECTION OF WATER MAINS NEAR SEWERS

In order to protect water mains from contamination by sewers, the installation of the water mains must conform to the following requirements:

a. Horizontal - When water lines and sewers are laid parallel with each other, the horizontal distance between them shall not be less than six feet (6'). Each line shall be laid on undisturbed or bedded material in a separate trench. Where conditions prevent the minimum horizontal separation set forth above, extra protection will be required. Extra protection shall consist of constructing the sewer main with mechanical joint ductile iron pipe or with slip-joint ductile iron pipe if joint restraint is provided, or encasing the sewer main in concrete. Extra protection shall consist of constructing the water main with mechanical joint ductile iron pipe or with slip-joint ductile pipe if joint restraint is provided. The water main shall not be encased in concrete.

The Construction Drawings shall indicate the installation requirements. The drawings showing these exceptions shall have been approved by the appropriate state and/or county health department. Refer to the diagram below f or clarification.



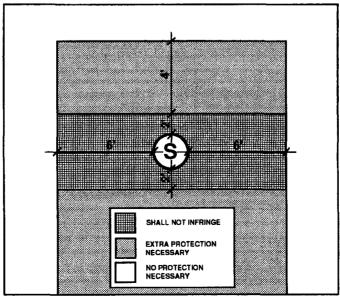
Under no circumstances will the horizontal separation between sewer mains and water mains be less than two feet (2'). All distances are to be measured from the outside of the sewer main to the outside of the water main.

b. Vertical - When a water main is parallel with or crosses a sewer main within two feet (2') above the sewer or greater than two feet (2') below the sewer, extra protection will be required. Extra protection shall consist of constructing the sewer main with mechanical joint ductile iron pipe or with slip-joint ductile iron pipe if joint restraint is provided, or encasing the sewer main in concrete. Extra protection shall consist of constructing the water main with mechanical joint ductile iron pipe or with slip-joint ductile pipe if joint restraint is provided. The water main shall not be encased in concrete.

The Construction Drawings shall indicate the installation requirements. The drawings showing these exceptions shall have been approved by the appropriate state and/or county health department.

Under no circumstances will the vertical separation of a sewer main installed above a water main be less than two feet (2'). All distances are to be measured from the outside of the sewer main to the outside of the water main. Refer to the diagram above for clarification.

- c. When unusual conditions such as, but not limited to, highway or bridge crossings prevent the water and sewer main separations required from being met, the appropriate state and/or county health department will review and may approve requests for authorization to use alternate construction techniques, materials and joints on a case-by-case basis.
- d. No water pipe shall pass through or come into contact with any part of a sewer manhole. The minimum horizontal separation between water mains and manholes shall be six feet (6'), measured from the center of the manhole.
- e. The minimum separation between force mains or pressure sewers and water mains shall be two feet (2') vertically and six feet (6') horizontally under all conditions. Where a sewer force main crosses above, or less than six feet (6') below, a water line, the sewer main shall be encased in at least six inches (6") of concrete for ten feet (10') on either side of the water main. Refer to the diagram below for clarification.



- f. Sewer mains (gravity, pressure, force) shall be kept a minimum of fifty feet (50') from drinking water wells, unless the following conditions are met:
 - Water main pipe, pressure tested in place to 50 psi without excessive leakage, may be used for gravity sewers at distances greater than twenty feet (20') from drinking water wells.
 - Water main pipe, pressure tested in place to 150 psi without excessive leakage, may be used for pressure sewers and force mains at distances greater than twenty feet (20') from drinking water wells.
- g. No septic tank/disposal field system shall be constructed within one hundred feet (100') of a drinking water well.
- h. All distances are measured perpendicularly from the outside of the sewer main to the outside of the water main. These separation requirements do not apply to building, plumbing or individual house service connections.
- Use Mechanical Joint ductile iron pipe with Megalug thrust restraints a minimum of ten (10') feet on each side of a sewer or storm drain crossing.

11. COMPACTION

When crossing existing water mains a minimum of 95% compaction is required to the bottom of existing mains.

Arizona Water Company requires that no slurry be permitted to contact existing cement/asbestos or ductile iron pipes, unless authorized by the company. Slurry may be poured in the bottom of the sewer trench stopping three inches (3") below the existing water main. The backfill used around the main should be AB in sufficient depth to prevent slurry from contacting existing main.

12. WATER MAIN MATERIAL SPECIFICATIONS

Ductile iron pipe (Push-on type) minimum class 350, cement lined and conform to AWWA C151.

All main line valves shall conform to AWWA C500 with a minimum working pressure of 200 psi.

All cast iron fittings to be cement lined in accordance with AWWA C104 and shall conform to AWWA C110 with a minimum working pressure of 250 psi. Except for the Coolidge System – See Note 4L.

Maximum joint deflection for 6" mechanical joint ductile iron pipe is seven degrees, seven minutes (7°, 7') or twenty-seven inches (27") per eighteen-foot (18') length pipe, for a maximum curve of one hundred forty-five feet (145').

Maximum joint deflection for 8" and 12" mechanical joint ductile iron pipe is five degrees, twenty-one minutes (5° 21') or twenty inches (20") per eighteen-foot (18') length pipe, for a maximum curve of one hundred ninety-five feet (195').

Maximum joint deflection for 6", 8" and 12" push-on joint ductile iron pipe is five degrees (5°) or nineteen inches (19") per eighteen-foot (18') length pipe for a maximum curve of two hundred five feet (205').

ARIZONA WATER COMPANY

STANDARD SPECIFICATION DRAWINGS: E-9-1

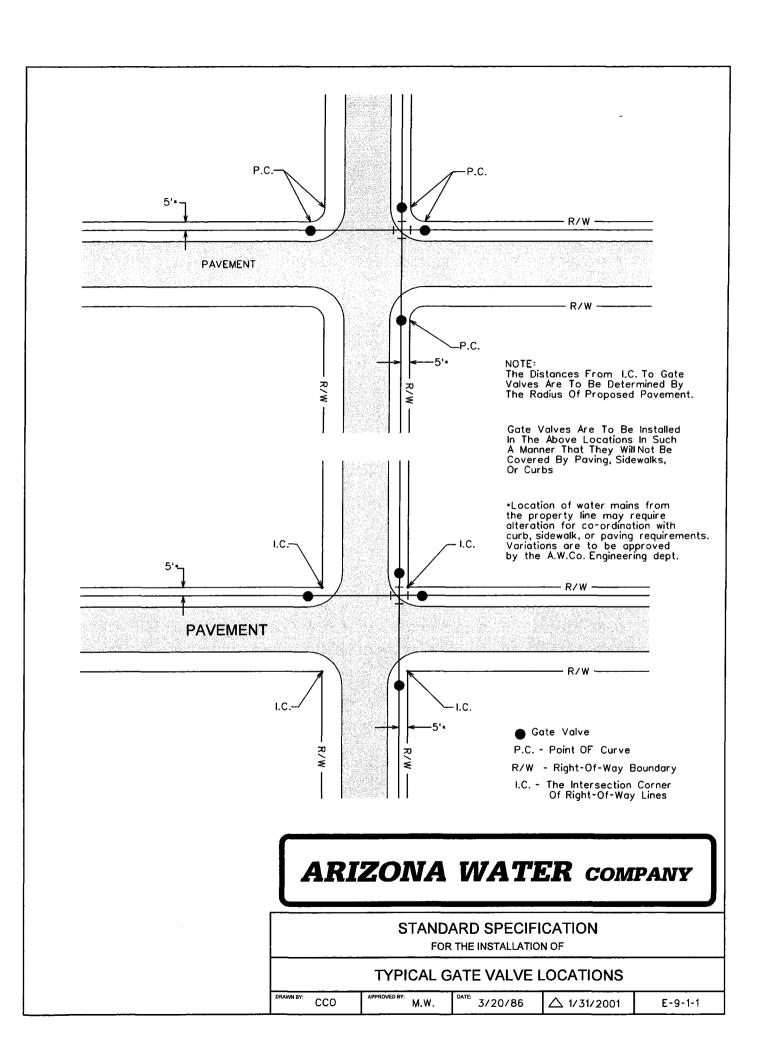
ARIZONA WATER COMPANY

STANDARD SPECIFICATION DRAWINGS

INDEX (E-9)

E-9-1	TYPICAL GATE VALVE LOCATIONS
E-9-2	INSTALLATION OF TYPICAL VERTICAL AND HORIZONTAL GATE VALVES
E-9-3	INSTALLATION OF TYPICAL TAPPING SLEEVE AND VALVE
E-9-4	INSTALLATION OF TYPICAL VALVE SUBJECT TO NON-VEHICULAR AND VEHICULAR TRAFFIC
E-9-5	INSTALLATION OF TYPICAL THRUST BLOCKING SCHEDULE, THRUST BLOCK FOR VERTICAL BENDS, AND MEGALUG THRUST RESTRAINTS
E-9-6	INSTALLATION OF TYPICAL PERPENDICULAR FIRE HYDRANT
E-9-7	INSTALLATION OF TYPICAL PARALLEL FIRE HYDRANT
E-9-8	INSTALLATION OF TYPICAL 2" BLOWOFF DEVICE, AND AIR RELEASE VALVE
E-9-9	INSTALLATION OF TYPICAL SINGLE SERVICE CONNECTION FOR A $^3/_4$ " OR 1" METER
E-9-10	INSTALLATION OF TYPICAL DOUBLE SERVICE CONNECTION FOR A $^3/_4{}^{\shortparallel}$ AND 1" METER
E-9-11	INSTALLATION OF TYPICAL 2" SERVICE CONNECTION
E-9-12	INSTALLATION OF 3" COMPOUND METER, 4" COMPOUND METER, 6" COMPOUND METER, 6" COMPOUND SERVICE, CONCRETE VAULT, AND NON-POTABLE PROPELLER METER
E-9-13	INSTALLATION OF TYPICAL 4" THRU 8" DETECTOR CHECK VALVES AND 3" THRU 10" REDUCED PRESSURE PRINCIPLE DETECTOR WITH BYPASS METER ASSEMBLY (RPDA) FOR FIRE LINE SERVICES
E-9-14	INSTALLATION OF TYPICAL PRESSURE RELIEF VALVE ASSEMBLY
E-9-15	INSTALLATION OF TYPICAL PRESSURE REDUCING STATION
E-9-16	PAINT COLOR SELECTION
E-9-17	STEEL WATER STORAGE TANK
E-9-18	HYDROPNEUMATIC TANK
E-9-19	INSTALLATION OF WELL SHELTER

E-9-20	INSTALLATION OF TYPICAL WELL WITH LINE SHAFT TURBINE PUMP
E-9-21	INSTALLATION OF TYPICAL WELL WITH SUBMERSIBLE TURBINE PUMP
E-9-22	INSTALLATION OF COLUMN PIPE, OIL TUBE AND LINE SHAFT
E-9-23	HOT TAP AND JUMPER METER CONNECTION
E-9-24	INSTALLATION OF TYPICAL WATER LINE ENCASEMENT
E-9-25	INSTALLATION OF CALCIUM HYPOCHLORITE TABLET CHLORINATOR
E-9-26	INSTALLATION OF CHAIN LINK FENCE
E-9-27	INSTALLATION OF SIDE HUNG WATER LINE SUSPENSION
E-9-28	PIPE WARNING TAPE, LOCATOR WIRE, AND LOCATOR WIRE TERMINATION
E-9-29	INSTALLATION OF A TYPICAL SAMPLING STATION

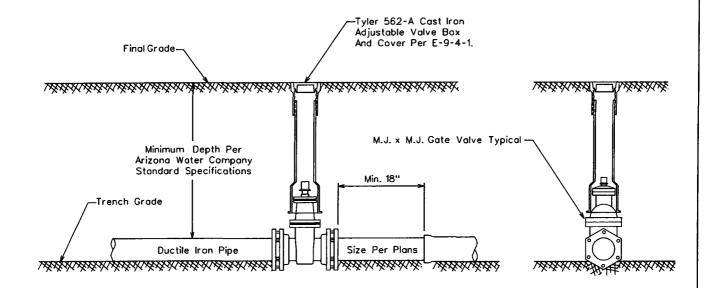


FOR 6" THROUGH 12" GATE VALVES

Mueller Resiliant Wedge Gate Valves Catalog Number A-2360-__ ANSI/AWWA C509 Compliant

FOR 14" THROUGH 16" GATE VALVES

Mueller Resiliant Wedge Gate Valves Catalog Number A-2361-__ ANSI/AWWA C509 Compliant



All Valves Installed On Pipe Five Feet (5') Deep And Greater Are To Be Installed With A Valve Operator Extension, Mueller Catalog No. A-26441.

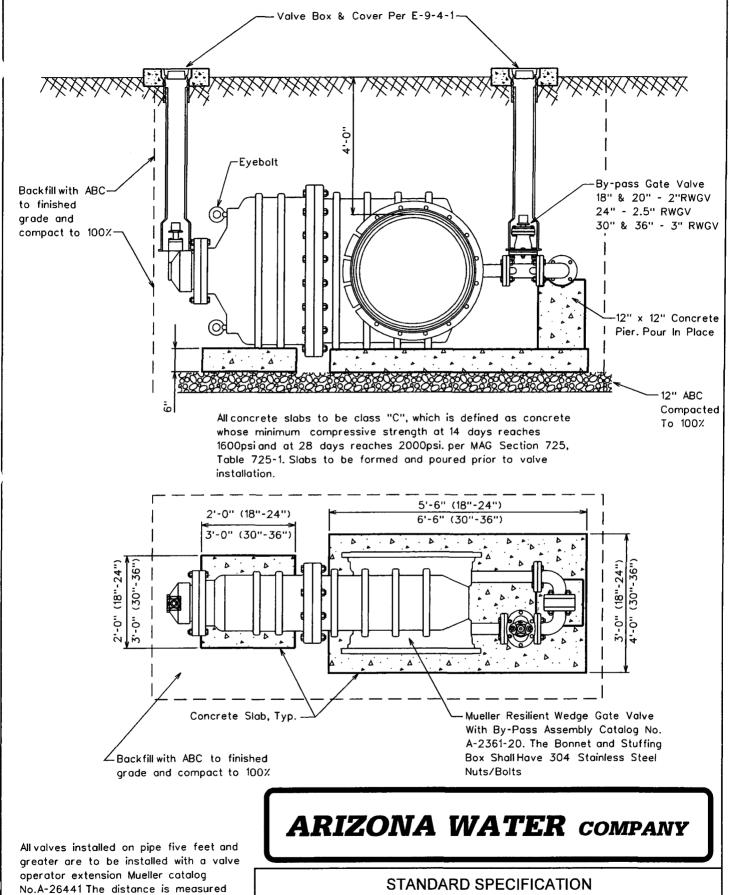
ARIZONA WATER COMPANY

STANDARD SPECIFICATION

FOR THE INSTALLATION OF

TYPICAL VERTICAL GATE VALVES

DRAWN BY: CB APPROVED BY: MW DATE: 03.20.1986 △ 08.23.2006 **E-9-2-1**

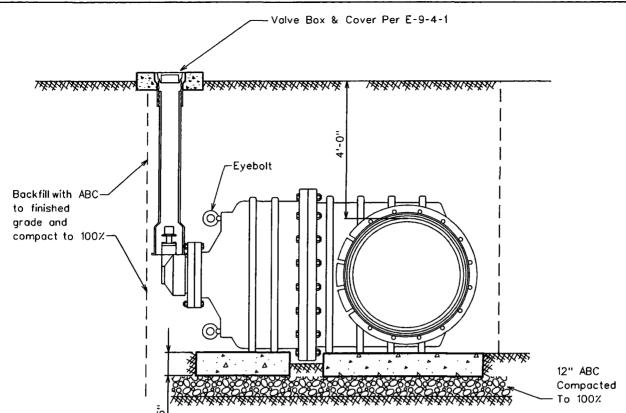


No.A-26441 The distance is measured from the top of the operating nut to final grade.

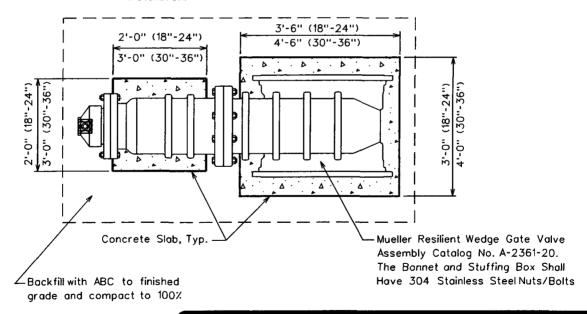
FOR THE INSTALLATION OF

INSTALLATION OF BEVEL GEARED HORIZONTAL GATE VALVES WITH BY-PASS FOR 18" AND LARGER VALVES

DRAWN BY: APPROVED BY: 12.07.2004 CB E-9-2-2



All concrete slabs to be class "C", which is defined as concrete whose minimum compressive strength at 14 days reaches 1600psi and at 28 days reaches 2000psi. per MAG Section 725, Table 725-1. Slabs to be formed and poured prior to valve installation.



All valves installed on pipe five feet and greater are to be installed with a valve operator extension Mueller catalog No.A-26441 The distance is measured from the top of the operating nut to final grade.

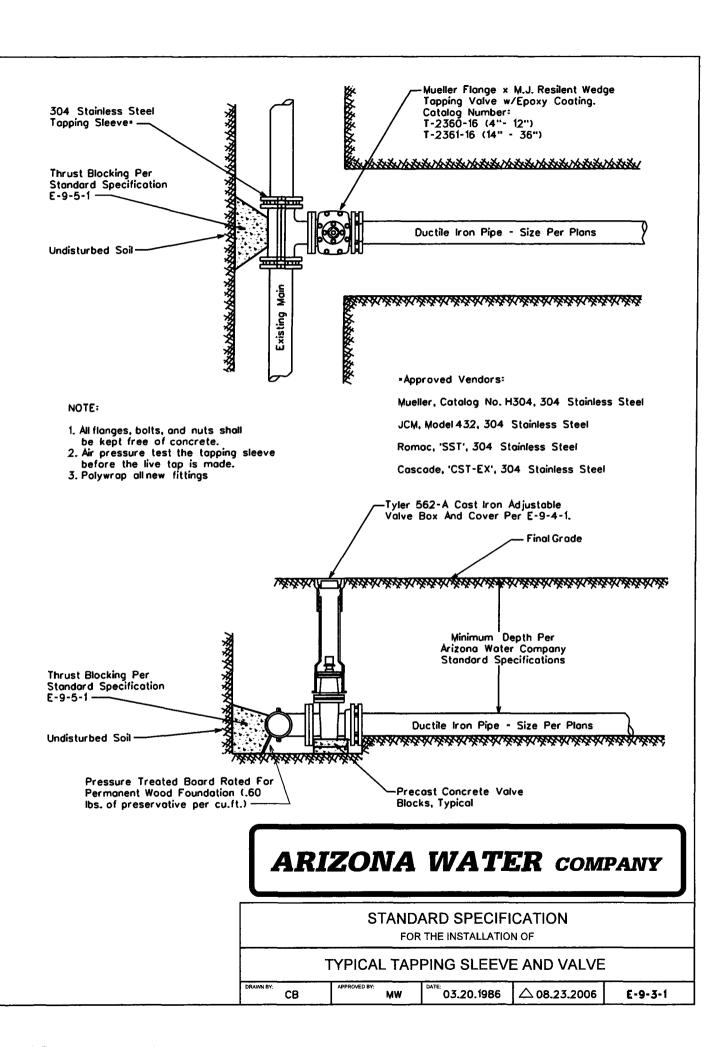
ARIZONA WATER COMPANY

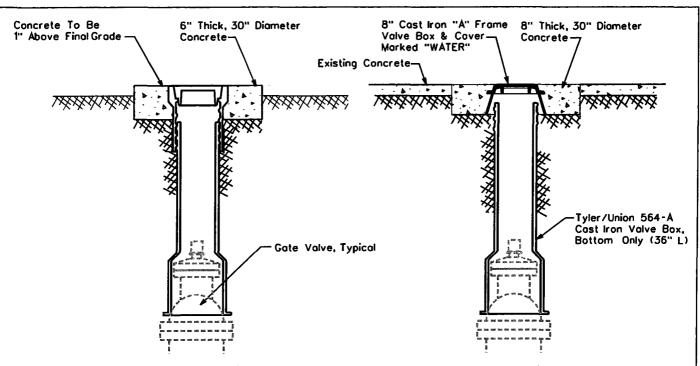
STANDARD SPECIFICATION

FOR THE INSTALLATION OF

INSTALLATION OF BEVEL GEARED HORIZONTAL GATE VALVES WITHOUT A BY-PASS FOR 18" AND LARGER VALVES

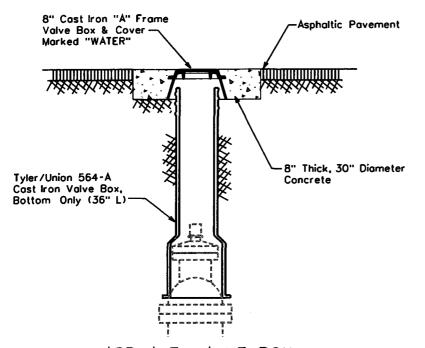
CB APPROVED BY: 12.07.2004 \(\triangle 5.13.2005 \) E-9-2-3





NON-VEHICULAR VALVE BOX

CONCRETE VALVE BOX For Areas Subject To Vehicular Traffic



NOTE:

- The Valve Box Shall Be Adjusted To Finished Grade Prior To Placing Of Asphalt And/Or Concrete.
- 2. For Non-Traffic Areas Use Tyler/Union 562-A, Two-Piece, 6855 Series Or Equivalent Adjustable Cast Iron Valve Box And Cover. Valves 4" To 12"

For Traffic Areas, Use Tyler/Union 564-A Bottom Section Only With An 8" Cast Iron "A" Frame With Cover. Valves 4" To 12"

- 3. All Valves Installed Five Feet (5') Deep And Greater Are To Be Installed With A Valve Operator Extension, Mueller Catalog No. A-26441 And Shall Have A Debris Cap
- 4. Use Minimum Class 'C' Concrete which is defined as concrete whose minimum compressive strength at 14 days reaches 1600psi and at 28 days reaches 2000psi. per MAG Section 725, Table 725-1.

ASPHALT VALVE BOX For Areas Subject To Vehicular Traffic

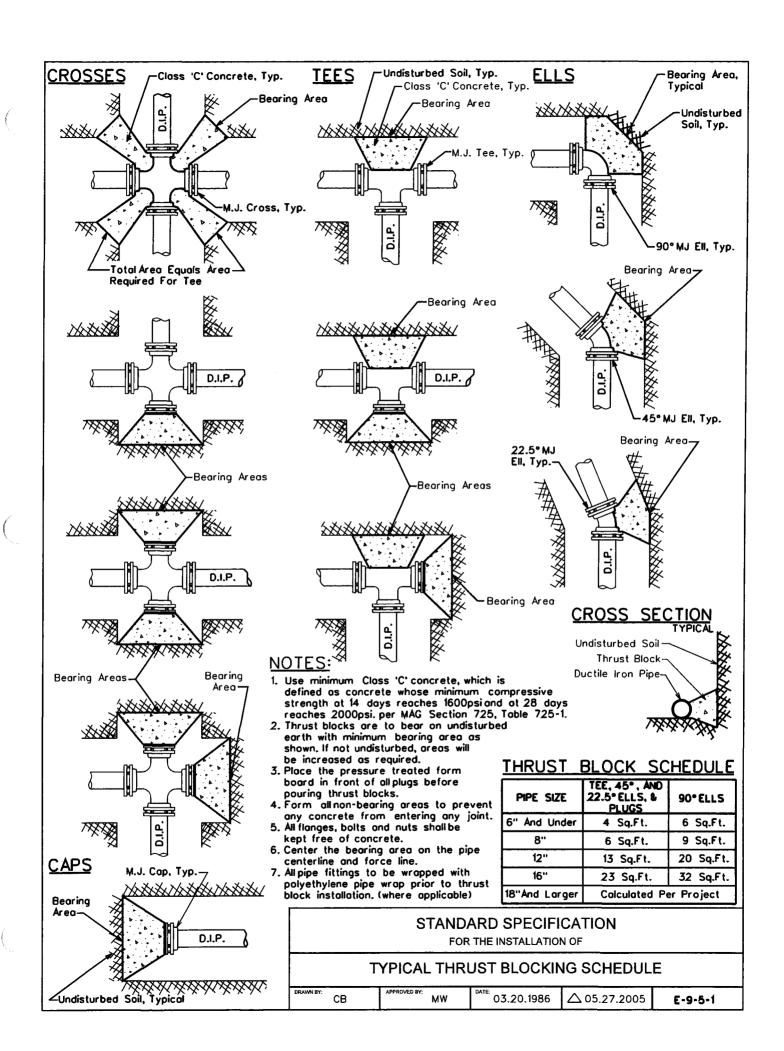
ARIZONA WATER COMPANY

STANDARD SPECIFICATION

FOR THE INSTALLATION OF

TYPICAL VALVE SUBJECT TO NON-VEHICULAR AND VEHICULAR TRAFFIC

DRAWN BY: CB APPROVED BY: MW DATE 03.20.1986 △ 8.24.2006 E-9-4-1

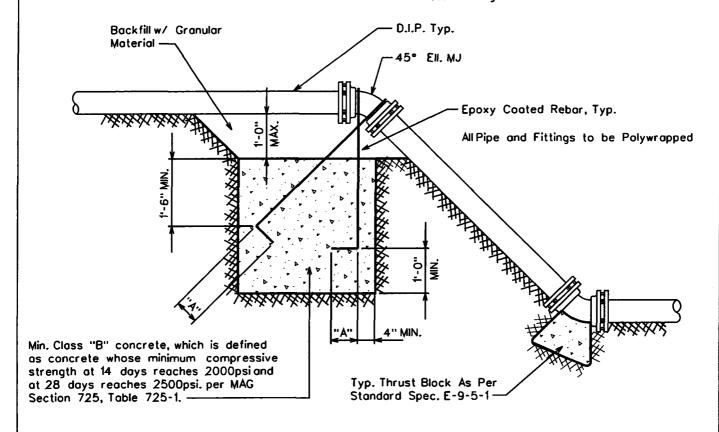


NOTES

- Bars In Conc. Thrust Block To Be Coated w/ 2 Coats Coal Tar Epoxy or by Other Approved Method.
- 2. Bars To Have 90° Hook & Their Ends, As Per Table Below.

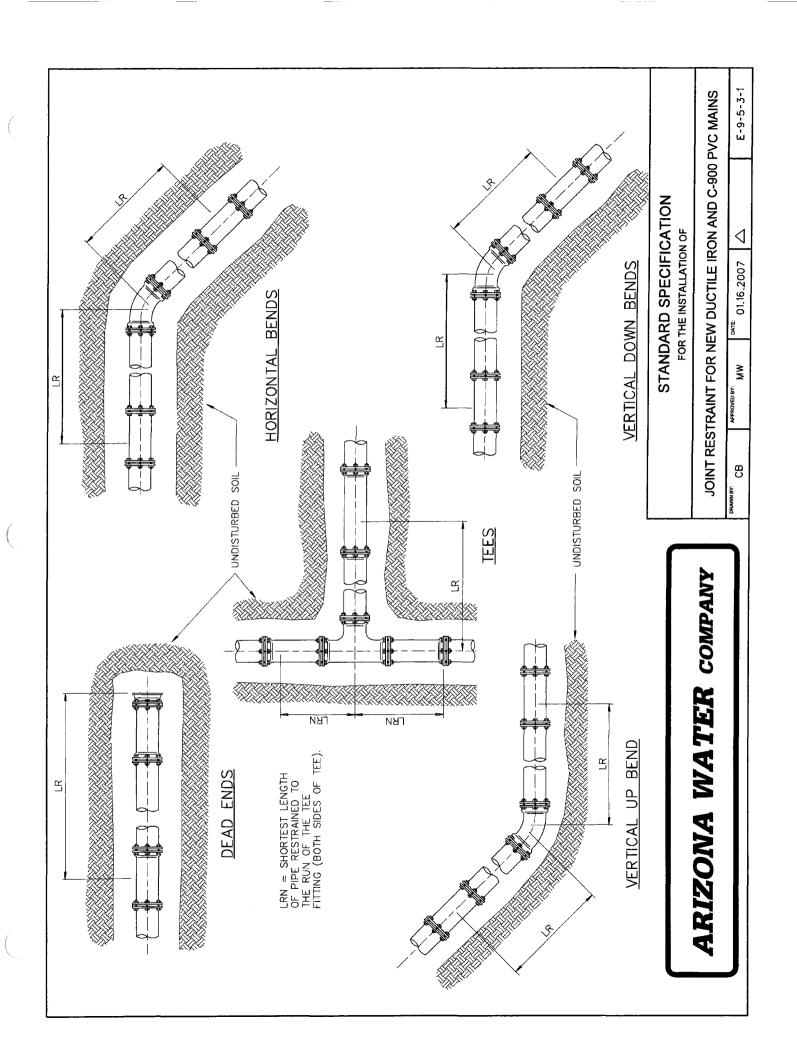
Pipe Size	Min. Bar Size	"A" Dimension (Hook)	 Min. Block Dimension (WxHxL)
6"	•6	6"	3'×3'×3'
8"	•6	9"	4'x3'x4'
12"	•8	9"	5'x4'x5'
16''	•9	12"	7'x6'x7'

* For 125 P.S.I. Working Pressure



ARIZONA WATER COMPANY

	- · · · · · · -	ARD SPECIF		
	THRUST BL	OCK FOR VER	TICAL BENDS	
DRAWN BY: JPK	APPROVED BY:	7-5-96	△ 01.16.2007	E-9-5-2



		DEAD	ENDS		31	44	58	69	84	92	104	115	126	147
		BEND FITTINGS		BEND	3	5	9	80	6	10	11	12	14	16
		22-1/2° BEI	NWOO	BEND	9	6	11	14	16	18	21	23	25	29
A PIPE	OFFSETS	FITTINGS	<u>a</u>	BEND	7	10	13	16	19	21	24	26	28	33
RESTRAINED LENGTHS, LR, FOR DUCTILE IRON PIPE	VERTICAL OFFSETS	45° BEND	NMOC	BEND	13	18	24	29	34	38	43	48	52	61
OR DUC	>	FITTINGS	dП	BEND	18	25	32	38	45	51	57	62	68	79
, LR, F(-	90° BEND	NWC C	BEND	31	44	28	69	81	92	104	115	126	147
ENGTHS	Ų	וברט		LRN=10'	8	20	34	45	25	68	79	06	100	121
AINED L	ļ	ᆜ		LRN=0'	30	43	56	68	80	91	103	113	125	145
RESTR	0	BENDS		22-1/2.	4	5	9	8	6	10	11	12	14	16
	F	HORIZON IAL		45.	7	10	13	16	19	21	24	26	28	33
	00	1 1 1 1 1		.06	18	25	32	38	45	51	57	62	68	79
	NOMINAL	7 C	3710	INCHES	4	9	8	10	12	14	16	18	20	24

		DEAD	ENDS		72	102	133	159	187	214	241	266	292	340
WRAP		FITTINGS		BEND	5	7	6	11	13	15	16	18	20	22
ENGTHS, LR, FOR DUCTILE IRON PIPE WITH POLYETHYLENE WRAP		22-1/2° BEND	NWCU	BEND	14	20	26	32	37	42	48	53	58	89
OLYETH	OFFSETS	45' BEND FITTINGS	<u>a</u>	BEND	F	15	19	23	27	31	34	38	41	47
WITH	VERTICAL OFFSETS	45° BEND	NWOO	BEND	30	42	55	99	77	89	100	110	121	141
ON PIPE	\	FITTINGS	<u>a</u>	BEND	26	36	47	56	65	74	82	06	98	113
TILE IR		90' BEND	NMOC	BEND	72	102	133	159	187	214	241	266	292	340
OR DUC	<u>.</u>	 		LRN=10'	18	47	78	103	131	156	183	207	233	280
S, LR, F	F	IEES		LRN=0,	69	66	130	157	185	211	238	263	289	337
LENGTH	() () () () () () () () () ()	DEINDS -		22-1/2.	5	7	6	11	13	15	16	18	20	22
AINED	T V E I V C	JORIZON I AL		45.	11	15	19	23	27	31	34	37	41	47
RESTRAINEI	7	אואטד		.06	26	36	47	99	9	74	82	90	98	113
	NOMINAL	7.7	375	INCHES	4	9	80	10	12	14	16	18	20	24

1. ALL JOINTS WITHIN THE SPECIFIED LENGTH LR MUST BE RESTRAINED. ALL LENGTHS ARE GIVEN IN FEET.

- 2. THE MAXIMUM TEST PRESSURE SHALL NOT EXCEED 200 PSI
- 3. THE MINIMUM DEPTH OF BURY SHALL BE 3' TO TOP OF PIPE.
- 4. RESTRAINED LENGTHS MAY BE REDUCED WHEN SUPPORTED BY ENGINEERING CALCULATIONS.

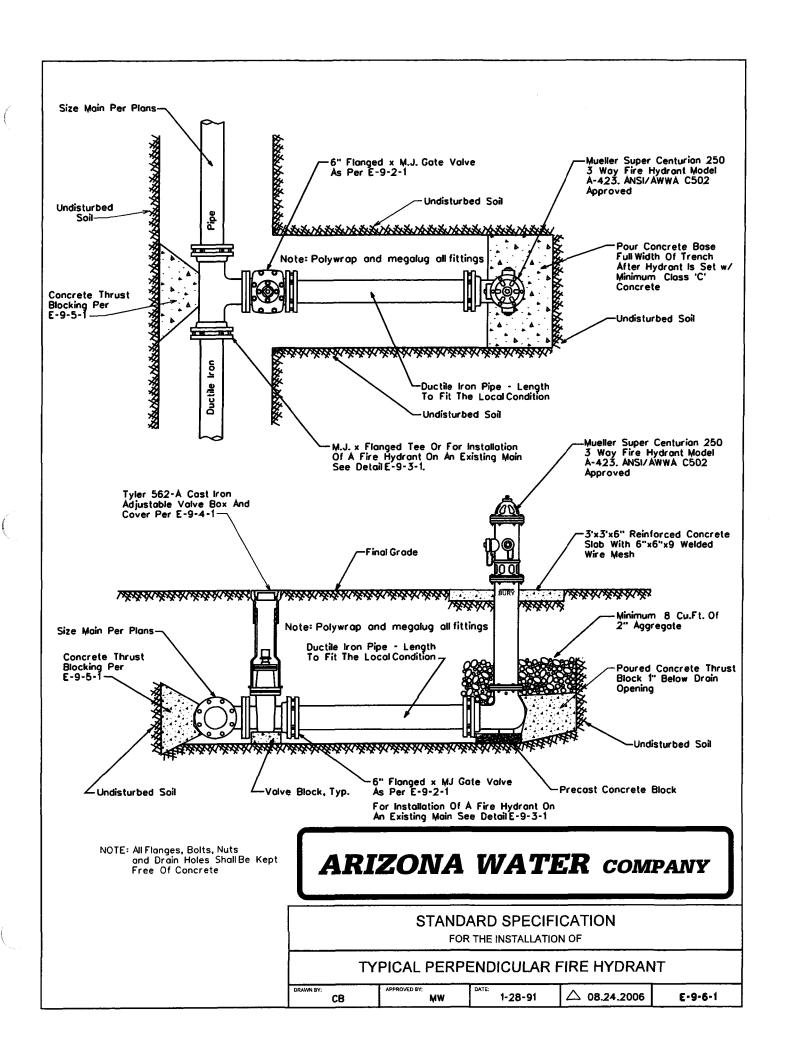
ARIZONA WATER COMPANY

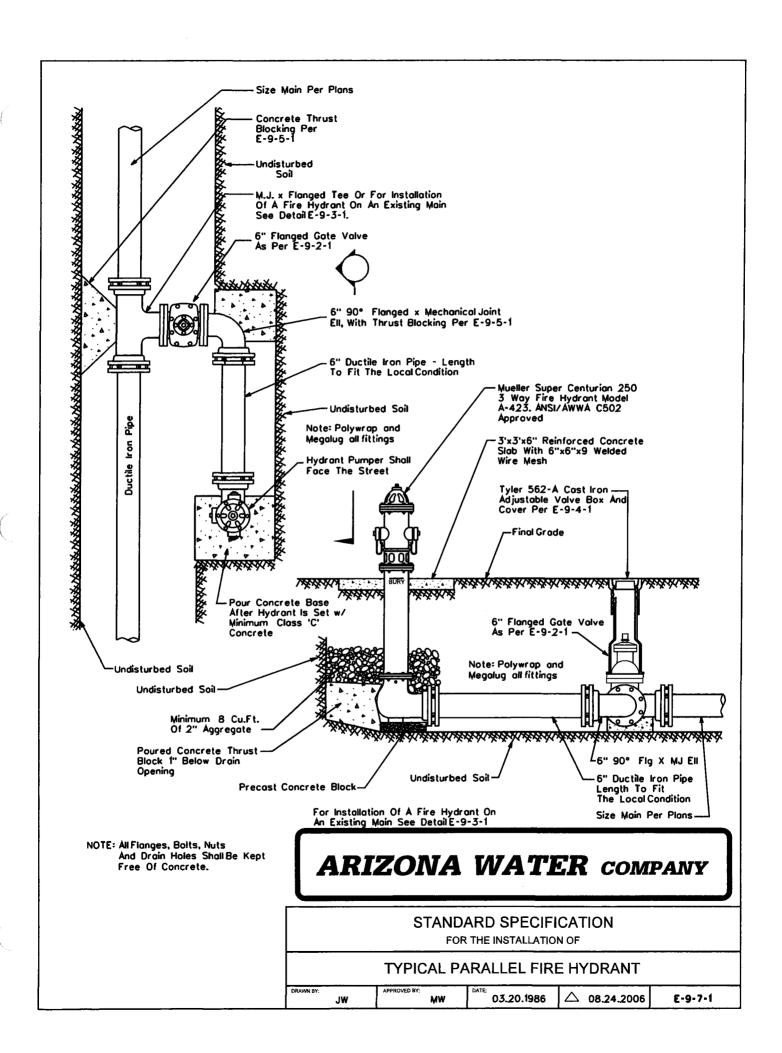
STANDARD SPECIFICATION

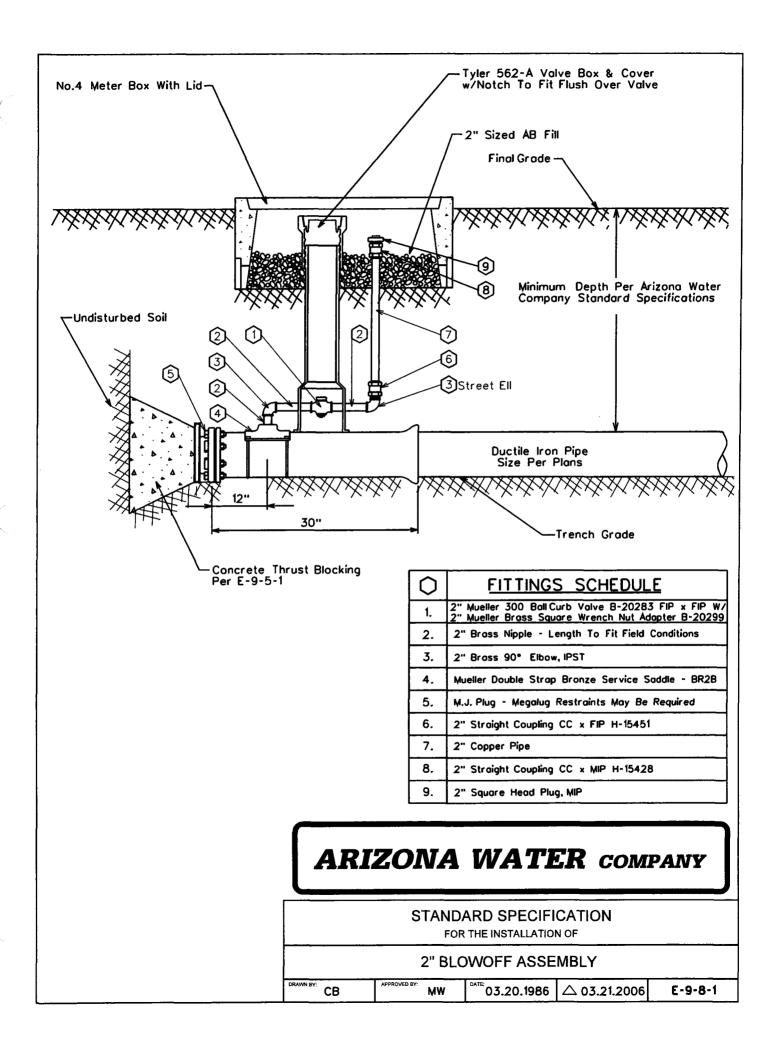
FOR THE INSTALLATION OF

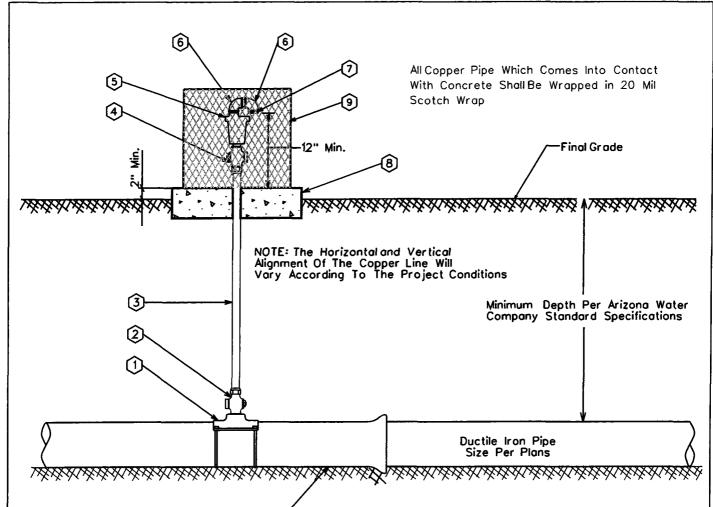
JOINT RESTRAINT FOR NEW DUCTILE IRON AND C-900 PVC MAINS

E-9-5-3-2	
◁	
DATE 01.16.2007	
АРРЕОУЕВ ВТ: MW	
DRAWN BY: CB	









GENERAL NOTES:

1. The valve shall be installed at high points and on long runs to vent the accumulation of air with the line under pressure- see the construction plans for specific locations.

Trench Grade

- 2. The valve shall have a ¾ " orifice with valve sealing faces of stainless steel and BUNA-N rubber.
- 3. The valve shall be Crispin model AR10 for 6" and larger water mains.
- 4. Crispin model AR10 valve construction consists of a 1" IPST inlet & $\frac{1}{2}$ " IPST outlet, cast iron body and top flange with stainless steel float and trim.
- 5. The air release assembly shall be located out of the path of traffic but within right-of-way or easement.

0	FITTINGS SCHEDULE
1.	Mueller BR2B Bronze Service Saddle - Double Strap
2.	1" Mueller B-25008 Taper x Comp. Ball Corp Stop
3.	1" Type 'K' Copper w/NO Splices - Field Fit
4.	1" Mueller B-25028 IP x Comp. Ball Corp Stop
5.	Crispin 1" Air Release Valve, Model AR10
6.	1/2" Brass Street Elbow
7.	No.16 Wire Mesh Screen (Non-Corrodible)
8.	4" Thick Concrete Pad - Class 'C' Concrete
9.	Guardshack, Model GS-1, Available From BPDI, Inc. Available In Leaf Green Or Desert Tan

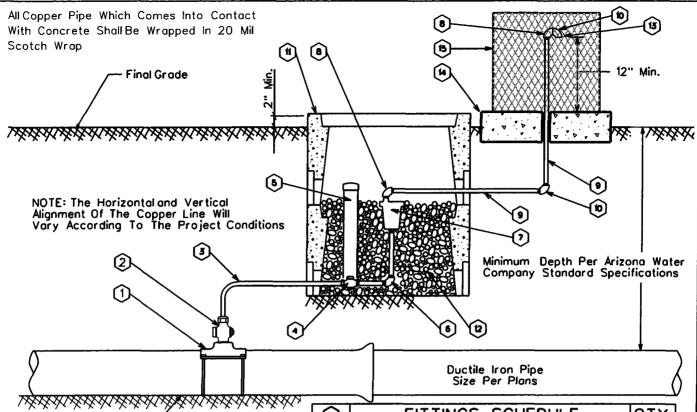
ARIZONA WATER COMPANY

STANDARD SPECIFICATION FOR THE INSTALLATION OF TYPICAL AIR RELEASE VALVE

CB APPROVED BY: MW DATE: 03.20

03.20.1997 \(\triangle 08.24.2006 \)

E-9-8-2



GENERAL NOTES:

Trench Grode

- The valve shall be installed at high points and on long runs to vent the accumulation of air with the line under pressure- see the construction plans for specific locations.
- 2. The valve shall have a 3/4" orifice with valve sealing faces of stainless steel and BUNA-N rubber.
- 3. The valve shall be Crispin model AR10 for 6" and larger water mains.
- Crispin model AR10 valve construction consists of a 1" IPST inlet & 1/2" IPST outlet, cast iron body and top flange with stainless steel float and trim.
- The air release assembly shall be located out of the path of traffic but within the right-of-way or easement.

<u>Q</u>	FITTINGS SCHEDULE	QTY.
1,	Mueller BR2B Bronze Service Saddle - Double Strap	1
2.	1" Mueller B-25008 Taper x Comp. Ball Corp Stop	1
3.	1" Type 'K' Copper w/NO Splices - Field Fit	As Req'd
4.	1" Mueller B-25028 IP × Comp. Ball Corp Stop	1
5.	3" PVC Pipe w/ Cap (Loose Fit)	1
6.	1" x 4" Brass Nipple w/90° Elbow	1
7.	Crispin 1" Air Release Valve, Model AR10	1
8.	1/2" Brass Street Elbow	2
9.	1/2" Galvanized Pipe - Length as req'd	2
10.	1/2" Galvanized 90° Ell	2
11,	Number 1 Meter Box	2
12.	2" Sized AB (Fill Meter Box To The Top Of The Air Release Valve)	As Reqid
13.	No.16 Wire Mesh Screen (Non-Corrodible)	1
14.	4" Thick Concrete Pad - Class 'C' Concrete	1
15.	Guardshack, Model GS-1, Available From BPDI, Inc. Available In Leaf Green Or Desert Tan	1

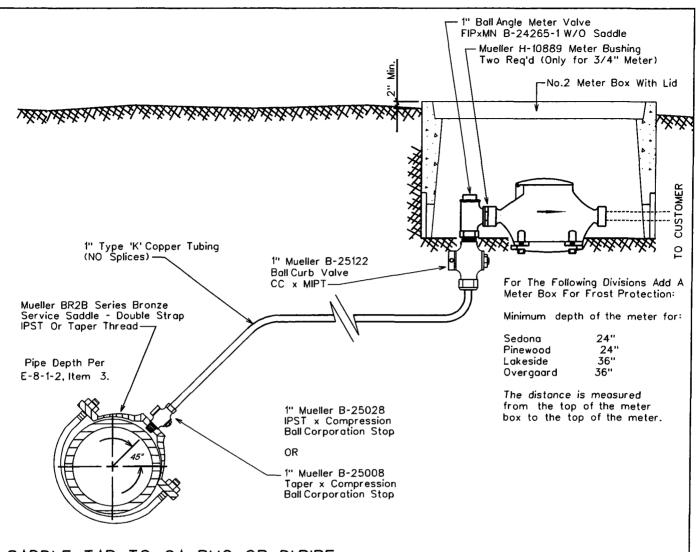
ARIZONA WATER COMPANY

STANDARD SPECIFICATION

FOR THE INSTALLATION OF

AIR RELEASE VALVE FOR THE NORTHERN REGION

DRAWN BY: CB APPROVED BY: MW DATE: 03.20.1997 \(\triangle 08.24.2006 \) E-9-8-3



SADDLE TAP TO CA, PVC, OR DIPIPE

NOTE: The minimum distance between taps on mains other than ductile iron is 12"

NOTE: Only the meter is supplied by Arizona Water Company

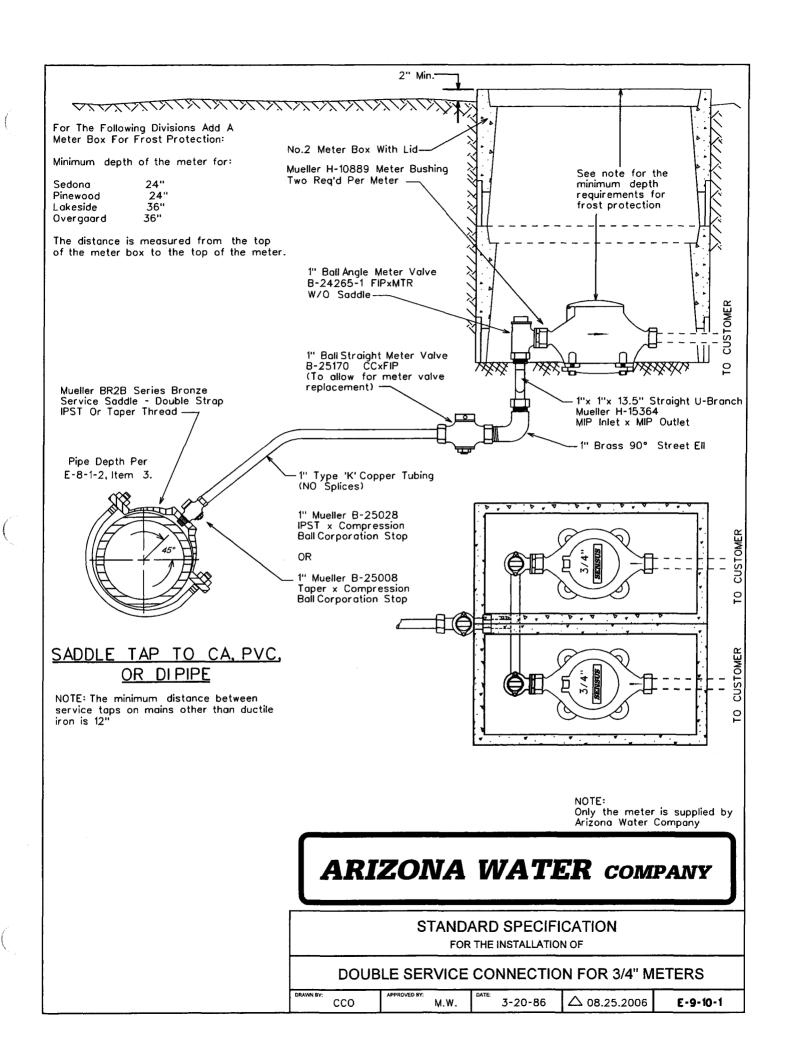
ARIZONA WATER COMPANY

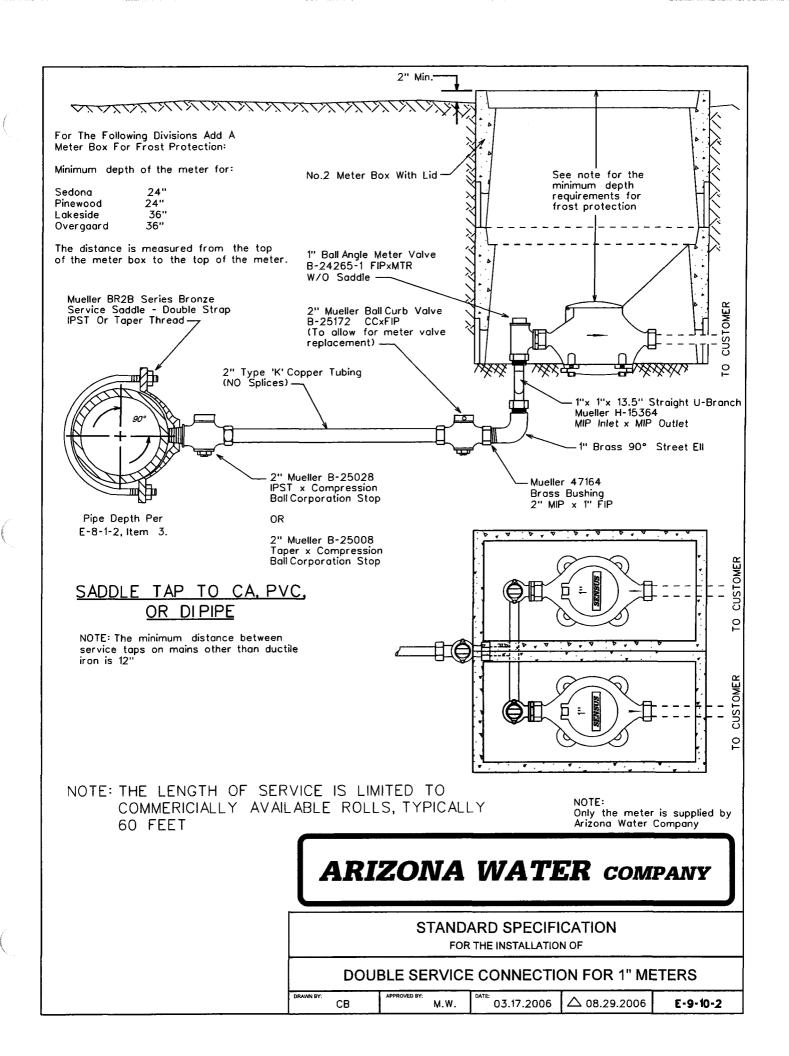
STANDARD SPECIFICATION

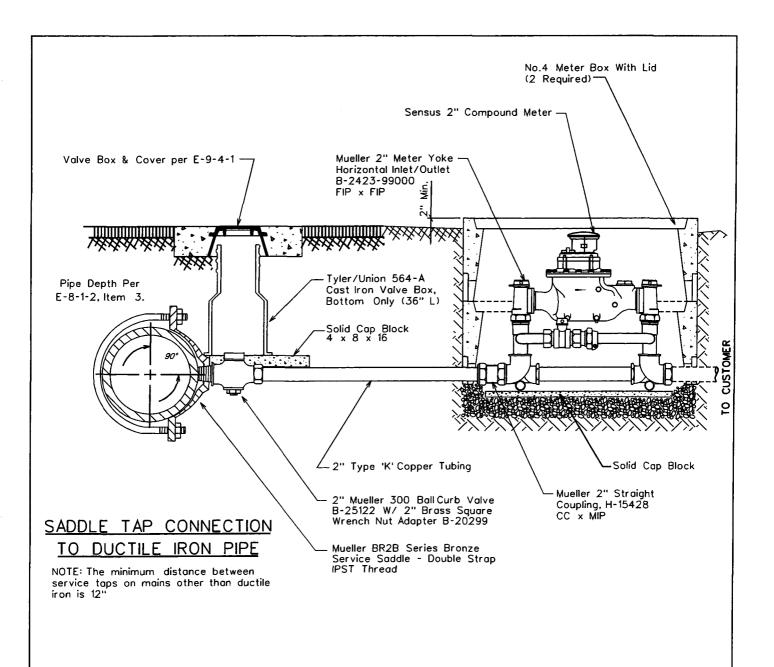
FOR THE INSTALLATION OF

SINGLE SERVICE CONNECTION FOR A 3/4" OR 1" METER

DRAWN BY: CCO APPROVED BY: M.W. DATE 3/20/86 △ 03.17.2006 **€-9-9-1**





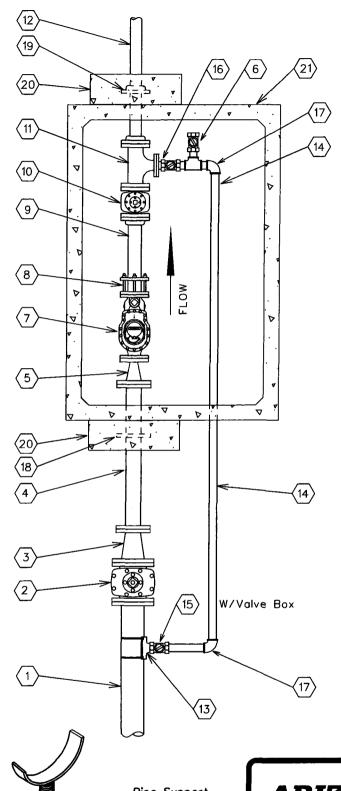


NOTE: THE LENGTH OF SERVICE IS LIMITED TO COMMERICIALLY AVAILABLE ROLLS, TYPICALLY 60 FEET

NOTE:

Only the meter is supplied by Arizona Water Company

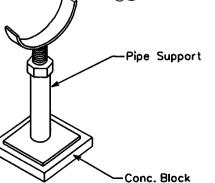
ARIZONA WATER COMPANY



No. FITTINGS SCHEDULE 1. 6" D.I.P. 2. 6" G.V.B.&C. mj x flng 3. 6"x4" Reducer flng x mj 4. 4"x3'-0" D.I.P. Spool flng x pe 5. 4" x 3" Reducer flng 6. 2" Test Port 7. 3" Compound Meter 8. 3" F.C.A. 9. 3"x2'-0" D.I. Spool flng x pe 10. 3" Gate Valve flng 11. 3"x2" Flg Tee w/ 2" Companion Flange 12. 3"x4'-0" D.I. Spool flng x pe 13. 6"x2" Tapping Saddle 14. 2" Copper Pipe 15. 2" Mueller B25122 Ball Valve w/B20299 Nut 16. 2" Locking Ball Valve (normally closed) 17. 2" Mueller H-15526 90° Ell CC x CC 18. 4" Megalug 19. 3" Slip-On Welding Flange 20. 24"x24"x8" Conc. Thrust Block P.I.P.		
2. 6" G.V.B.&C. mj x flng 3. 6"x4" Reducer flng x mj 4. 4"x3'-0" D.I.P. Spool flng x pe 5. 4" x 3" Reducer flng 6. 2" Test Port 7. 3" Compound Meter 8. 3" F.C.A. 9. 3"x2'-0" D.I. Spool flng x pe 10. 3" Gate Valve flng 11. 3"x2" Flg Tee w/ 2" Companion Flange 12. 3"x4'-0" D.I. Spool flng x pe 13. 6"x2" Tapping Saddle 14. 2" Copper Pipe 15. 2" Mueller B25122 Ball Valve w/B20299 Nut 16. 2" Locking Ball Valve (normally closed) 17. 2" Mueller H-15526 90° Ell CC x CC 18. 4" Megalug 19. 3" Slip-On Welding Flange 20. 24"x24"x8" Conc. Thrust Block P.I.P.	No.	FITTINGS SCHEDULE
3. 6"x4" Reducer flng x mj 4. 4"x3'-0" D.I.P. Spool flng x pe 5. 4" x 3" Reducer flng 6. 2" Test Port 7. 3" Compound Meter 8. 3" F.C.A. 9. 3"x2'-0" D.I. Spool flng x pe 10. 3" Gate Valve flng 11. 3"x2" Flg Tee w/ 2" Companion Flange 12. 3"x4'-0" D.I. Spool flng x pe 13. 6"x2" Tapping Saddle 14. 2" Copper Pipe 15. 2" Mueller B25122 Ball Valve w/B20299 Nut 16. 2" Locking Ball Valve (normally closed) 17. 2" Mueller H-15526 90° Ell CC x CC 18. 4" Megalug 19. 3" Slip-On Welding Flange 20. 24"x24"x8" Conc. Thrust Block P.I.P.	1.	6" D.I.P.
4. 4"x3'-0" D.I.P. Spool fing x pe 5. 4" x 3" Reducer fing 6. 2" Test Port 7. 3" Compound Meter 8. 3" F.C.A. 9. 3"x2'-0" D.I. Spool fing x pe 10. 3" Gate Valve fing 11. 3"x2" Fig Tee w/ 2" Companion Flange 12. 3"x4'-0" D.I. Spool fing x pe 13. 6"x2" Tapping Saddle 14. 2" Copper Pipe 15. 2" Mueller B25122 Ball Valve w/B20299 Nut 16. 2" Locking Ball Valve (normally closed) 17. 2" Mueller H-15526 90° Ell CC x CC 18. 4" Megalug 19. 3" Slip-On Welding Flange 20. 24"x24"x8" Conc. Thrust Block P.I.P.	2.	6" G.V.B.&C. mj x flng
5. 4" x 3" Reducer flng 6. 2" Test Port 7. 3" Compound Meter 8. 3" F.C.A. 9. 3"x2'-0" D.I. Spool flng x pe 10. 3" Gate Valve flng 11. 3"x2" Flg Tee w/ 2" Companion Flange 12. 3"x4'-0" D.I. Spool flng x pe 13. 6"x2" Tapping Saddle 14. 2" Copper Pipe 15. 2" Mueller B25122 Ball Valve w/B20299 Nut 16. 2" Locking Ball Valve (normally closed) 17. 2" Mueller H-15526 90° Ell CC x CC 18. 4" Megalug 19. 3" Slip-On Welding Flange 20. 24"x24"x8" Conc. Thrust Block P.I.P.	3.	6"x4" Reducer flng x mj
6. 2" Test Port 7. 3" Compound Meter 8. 3" F.C.A. 9. 3"x2'-0" D.I. Spool flng x pe 10. 3" Gate Valve flng 11. 3"x2" Flg Tee w/ 2" Companion Flange 12. 3"x4'-0" D.I. Spool flng x pe 13. 6"x2" Tapping Saddle 14. 2" Copper Pipe 15. 2" Mueller B25122 Ball Valve w/B20299 Nut 16. 2" Locking Ball Valve (normally closed) 17. 2" Mueller H-15526 90° Ell CC x CC 18. 4" Megalug 19. 3" Slip-On Welding Flange 20. 24"x24"x8" Conc. Thrust Block P.I.P.	4.	4"x3'-0" D.I.P. Spool fing x pe
7. 3" Compound Meter 8. 3" F.C.A. 9. 3"x2'-0" D.I. Spool flng x pe 10. 3" Gate Valve flng 11. 3"x2" Flg Tee w/ 2" Companion Flange 12. 3"x4'-0" D.I. Spool flng x pe 13. 6"x2" Tapping Saddle 14. 2" Copper Pipe 15. 2" Mueller B25122 Ball Valve w/B20299 Nut 16. 2" Locking Ball Valve (normally closed) 17. 2" Mueller H-15526 90° Ell CC x CC 18. 4" Megalug 19. 3" Slip-On Welding Flange 20. 24"x24"x8" Conc. Thrust Block P.I.P.	5.	4" x 3" Reducer flng
8. 3" F.C.A. 9. 3"x2'-0" D.I. Spool flng x pe 10. 3" Gate Valve flng 11. 3"x2" Flg Tee w/ 2" Companion Flange 12. 3"x4'-0" D.I. Spool flng x pe 13. 6"x2" Tapping Saddle 14. 2" Copper Pipe 15. 2" Mueller B25122 Ball Valve w/B20299 Nut 16. 2" Locking Ball Valve (normally closed) 17. 2" Mueller H-15526 90° Ell CC x CC 18. 4" Megalug 19. 3" Slip-On Welding Flange 20. 24"x24"x8" Conc. Thrust Block P.I.P.	6.	2" Test Port
9. 3"x2'-0" D.I. Spool flng x pe 10. 3" Gate Valve flng 11. 3"x2" Flg Tee w/ 2" Companion Flange 12. 3"x4'-0" D.I. Spool flng x pe 13. 6"x2" Tapping Saddle 14. 2" Copper Pipe 15. 2" Mueller B25122 Ball Valve w/B20299 Nut 16. 2" Locking Ball Valve (normally closed) 17. 2" Mueller H-15526 90° Ell CC x CC 18. 4" Megalug 19. 3" Slip-On Welding Flange 20. 24"x24"x8" Conc. Thrust Block P.I.P.	7.	3" Compound Meter
10. 3" Gate Valve flng 11. 3"x2" Flg Tee w/ 2" Companion Flange 12. 3"x4'-0" D.I. Spool flng x pe 13. 6"x2" Tapping Saddle 14. 2" Copper Pipe 15. 2" Mueller B25122 Ball Valve w/B20299 Nut 16. 2" Locking Ball Valve (normally closed) 17. 2" Mueller H-15526 90° Ell CC x CC 18. 4" Megalug 19. 3" Slip-On Welding Flange 20. 24"x24"x8" Conc. Thrust Block P.I.P.	8.	3" F.C.A.
11. 3"x2" Flg Tee w/ 2" Companion Flange 12. 3"x4'-0" D.I. Spool flng x pe 13. 6"x2" Tapping Saddle 14. 2" Copper Pipe 15. 2" Mueller B25122 Ball Valve w/B20299 Nut 16. 2" Locking Ball Valve (normally closed) 17. 2" Mueller H-15526 90° Ell CC x CC 18. 4" Megalug 19. 3" Slip-On Welding Flange 20. 24"x24"x8" Conc. Thrust Block P.I.P.	9.	3"x2'-0" D.I. Spool fing x pe
12. 3"x4'-0" D.I. Spool fing x pe 13. 6"x2" Tapping Saddle 14. 2" Copper Pipe 15. 2" Mueller B25122 Ball Valve w/B20299 Nut 16. 2" Locking Ball Valve (normally closed) 17. 2" Mueller H-15526 90° Ell CC x CC 18. 4" Megalug 19. 3" Slip-On Welding Flange 20. 24"x24"x8" Conc. Thrust Block P.I.P.	10.	3" Gate Valve flng
 13. 6"x2" Tapping Saddle 14. 2" Copper Pipe 15. 2" Mueller B25122 Ball Valve w/B20299 Nut 16. 2" Locking Ball Valve (normally closed) 17. 2" Mueller H-15526 90° Ell CC x CC 18. 4" Megalug 19. 3" Slip-On Welding Flange 20. 24"x24"x8" Conc. Thrust Block P.I.P. 	11.	3"x2" Flg Tee w/ 2" Companion Flange
14. 2" Copper Pipe 15. 2" Mueller B25122 Ball Valve w/B20299 Nut 16. 2" Locking Ball Valve (normally closed) 17. 2" Mueller H-15526 90° Ell CC x CC 18. 4" Megalug 19. 3" Slip-On Welding Flange 20. 24"x24"x8" Conc. Thrust Block P.I.P.	12.	3"x4'-0" D.I. Spool flng x pe
 15. 2" Mueller B25122 Ball Valve w/B20299 Nut 16. 2" Locking Ball Valve (normally closed) 17. 2" Mueller H-15526 90° Ell CC x CC 18. 4" Megalug 19. 3" Slip-On Welding Flange 20. 24"x24"x8" Conc. Thrust Block P.I.P. 	13.	6"x2" Tapping Saddle
16. 2" Locking Ball Valve (normally closed) 17. 2" Mueller H-15526 90° Ell CC x CC 18. 4" Megalug 19. 3" Slip-On Welding Flange 20. 24"x24"x8" Conc. Thrust Block P.I.P.	14.	2" Copper Pipe
 2" Mueller H-15526 90° Ell CC x CC 4" Megalug 3" Slip-On Welding Flange 24"x24"x8" Conc. Thrust Block P.I.P. 	15.	2" Mueller B25122 Ball Valve w/B20299 Nut
18. 4" Megalug19. 3" Slip-On Welding Flange20. 24"x24"x8" Conc. Thrust Block P.I.P.	16.	2" Locking Ball Valve (normally closed)
19. 3" Slip-On Welding Flange20. 24"x24"x8" Conc. Thrust Block P.I.P.	17.	2" Mueller H-15526 90° Ell CC x CC
20. 24"x24"x8" Conc. Thrust Block P.I.P.	18.	4" Megalug
	19.	3" Slip-On Welding Flange
21 575-LA Conc. Voult	20.	24"x24"x8" Conc. Thrust Block P.I.P.
ZI, J/J-LA CONC. VOUIL	21.	575-LA Conc. Vault

NOTE:

- Use Rowley pipe supports or equivalent as needed (See detail below).
- 2. Pipe support locations to be determined by field personnel.
- 3. All copper pipe that comes in contact with concrete to be wrapped w/10-20 Mil. Scotchwrap corrosion protection tape.
- 4. All mechanical joint fittings are to be megalugged.
- 5. Use deflection fittings (45° Ells.) to achieve necessary depths & cover as shown on the standard specification for the installation of a concrete vault (E-9-12-5).



ARIZONA WATER COMPANY

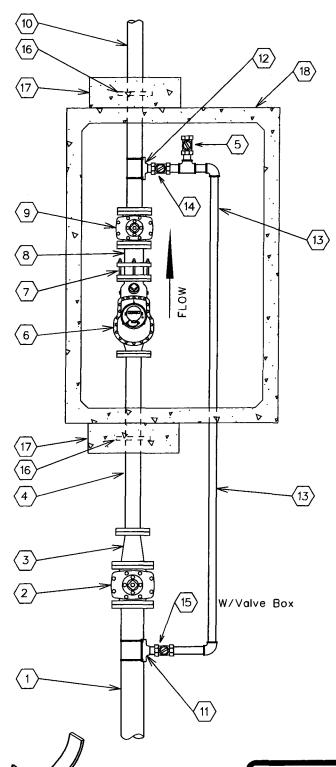
STANDARD SPECIFICATION

FOR THE INSTALLATION OF

3" COMPOUND METER

E-9-12-1

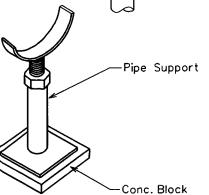
CCO APPROVED BY: MW DATE: 10/5/1993 \(\triangle 08.29.2006 \)



No.	FITTINGS SCHEDULE
1.	6" D.I.P.
2.	6" G.V.B.&C. mj x flng
3.	6"x4" Reducer flng x mj
4.	4"x3'-0" D.I.P. Spool fing x pe
5.	2" Test Port
6.	4" Compound Meter
7.	4" F.C.A.
8.	4"x1'-0" D.I.P. Spool fing x pe
9.	4" Gate Valve fing
10.	4"x4'-0" D.I.P. Spool fing x pe
11.	6"x2" Tapping Saddle
12.	4"x2" Tapping Saddle
13.	2" Copper Pipe
14.	2" Ball Valve / Locking (Normally Closed)
15.	2" Mueller B25122 Ball Valve w/B20299 Nut
16.	4" Megalug
17.	24"x24"x8" Conc. Thrust Block P.I.P.
18.	575-LA Conc. Vault

NOTE:

- 1. Use Rowley pipe supports or equivalent as needed (See detail below).
- 2. Pipe support locations to be determined by field personnel.
- 3. All copper pipe that comes in contact with concrete to be wrapped w/10-20 Mil. Scotchwrap corrosion protection tape.
- 4. All mechanical joint fittings are to be megalugged.
- 5. Use deflection fittings (45° Ells.) to achieve necessary depths & cover as shown on the standard specification for the installation of a concrete vault (E-9-12-5).



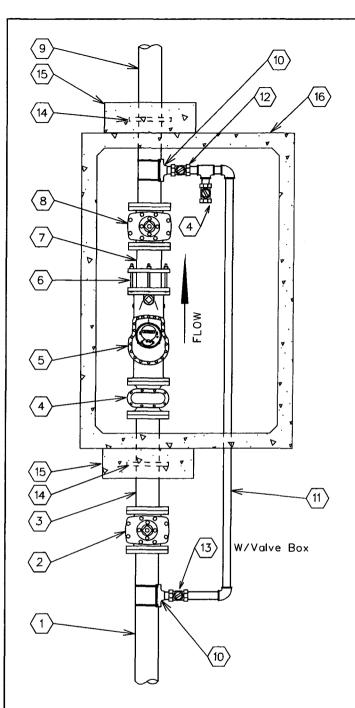
ARIZONA WATER COMPANY

STANDARD SPECIFICATION

FOR THE INSTALLATION OF

4" COMPOUND METER

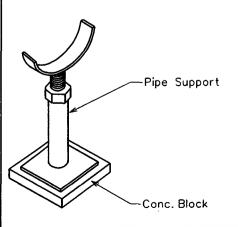
DRAWN BY: CCO APPROVED BY: MW DATE: 10/5/1993 △08.29.2006 E-9-12-2



No.	FITTINGS SCHEDULE
1.	6" D.I.P.
2.	6" G.V.B.&C. mj
3.	6"x 3'-0" D.I.P. Spool flng x pe
4.	2" Test Port
5.	6" Compound Meter
6.	6" F.C.A.
7.	6"x 1'-0" D.I.P. Spool fing x pe
8.	6" Gate Valve fing
9.	6"x 4'-0" D.I.P. Spool flng x pe
10.	6"x2" Tapping Saddle
11.	2" Copper Pipe
12.	2" Ball Valve / Locking (Normally Closed)
13.	2" Mueller B25122 Ball Valve w/B20299 Nut
14.	6" Megalug
15.	24"x24"x8" Conc. Thrust Block P.I.P.
16.	575-LA Conc. Vault

NOTE:

- 1. Use Rowley pipe supports or equivalent as needed (See detail below).
- 2. Pipe support locations to be determined by field personnel.
- 3. All copper pipe that comes in contact with concrete to be wrapped w/10-20 Mil. Scotchwrap corrosion protection tape.
- 4. All mechanical joint fittings are to be megalugged.
- 5. Use deflection fittings (45° Ells.) to achieve necessary depths & cover as shown on the standard specification for the installation of a concrete vault (E-9-12-5).



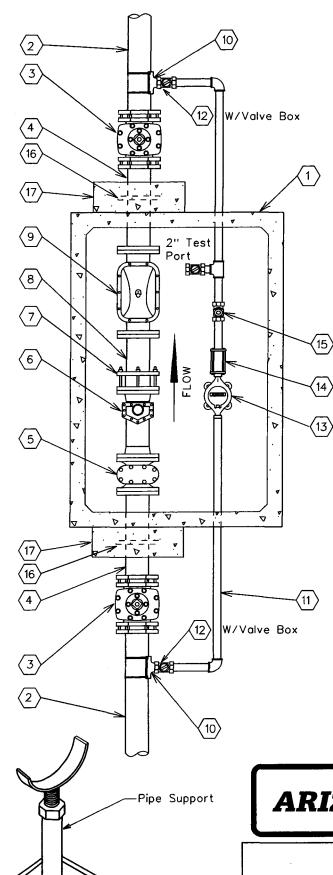
ARIZONA WATER COMPANY

STANDARD SPECIFICATION

FOR THE INSTALLATION OF

6" COMPOUND METER

DRAVM BY: CCO APPROVED BY: MW DATE: 10/5/1993 \(\triangle 08.29.2006 \) E-9-12-3



Conc. Block

No.	FITTINGS SCHEDULE					
1.	575-LA Conc. Vault					
2.	6" D.I.P.					
3.	6" G.V.B.&C. m.j.					
4.	6" x 3'-0" D.I.P. SPoolPiece flng x pe					
5.	6" Strainer					
6.	6" Turbo Meter					
7.	6" F.C.A.					
8.	6" x 2'-0" D.I.P. Spool Piece flng x pe					
	(TRIM SPOOL PIECE TO 3x THE PIPE DIA.)					
9.	6" Detector Check					
10.	6"x×N" Tapping Saddle					
11.	*N" Copper Pipe					
12.	∗N" Ball Valve (Locking)					
13.	*N" Meter					
14.	≠N" Coup. Adapt.					
15.	∗N'' Flapper Check Valve					
16.	6" Megalug					
17.	24"x24"x8" Conc. Thrust Block P.I.P.					

*N - Size To Be determined By A.W.Co.

NOTE:

- 1. Use Rowley pipe supports or equivalent as needed (See detail below).
- 2. Pipe support locations to be determined by field personnel.
- 3. All copper pipe that comes in contact with concrete to be wrapped w/10-20 Mil. Scotchwrap corrosion protection tape.
- 4. All mechanical joint fittings are to be megalugged.
- 5. Use deflection fittings (45° Ells.) to achieve necessary depths & cover as shown on the standard specification for the installation of a concrete vault (E-9-12-5).
- To change from a 6" service to a 4" service, change all listed 6" materials to 4" materials.

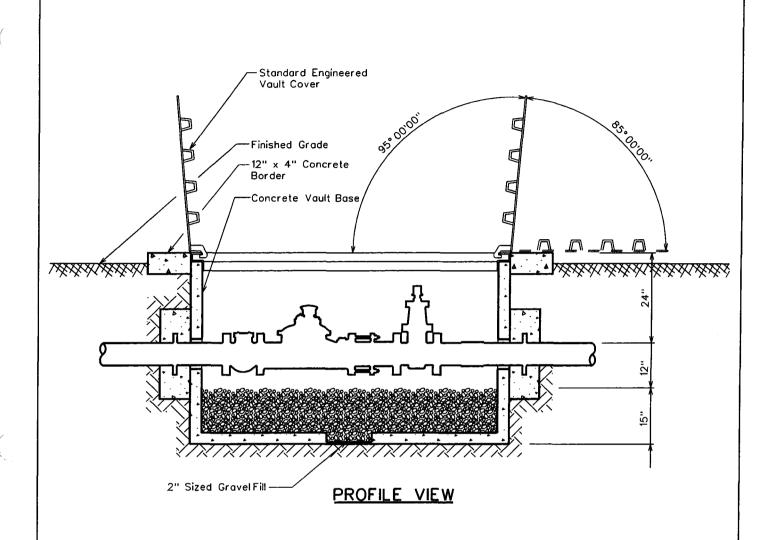
ARIZONA WATER COMPANY

STANDARD SPECIFICATION

FOR THE INSTALLATION OF

6" COMPOUND SERVICE

DRAWN BY: CCO APPROVED BY: MW DATE: 10/05/1993 \(\triangle 08.29.2006 \) E-9-12-4



CONCRETE VAULT & COVER SPECIFICATIONS

Vault - Base No. 575-BL

Cover - Standard Engineered Vault Cover

- . 4874 Aluminum Diamond Plate Cover For Non-Traffic Loading Areas
- . 4874 Galvanized Steel Diamond Plate
- Cover W/ H-20 Traffic Loading
 Double Torsion Spring Assisted Doors W/ Recessed Hasp & Safety Latches

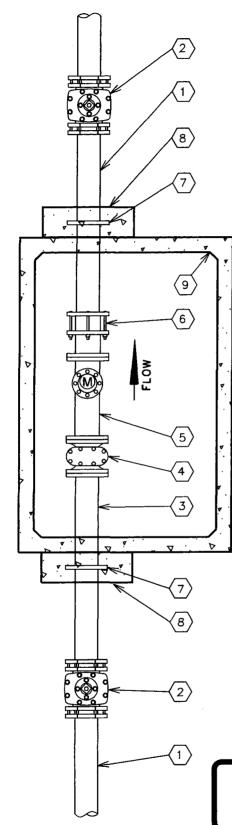
NOTES

- Total Depth Of Concrete Vault To Be A Maximum Of 3'-0" From Top Of Vault Cover To Top Of Gravel Fill.

 Service Connections Larger Than 6" In Diameter Will Conform To The Same Vault & Cover Specifications. Size Of Vault & Cover To Be Determined By A W.Co. Engineers A.W.Co. Engineers.

ARIZONA WATER COMPANY

STANDARD SPECIFICATION FOR THE INSTALLATION OF **CONCRETE VAULT** CCO △ 05.17.2001 MW 10/5/1993 E-9-12-5



No.	FITTINGS SCHEDULE		
1.	Ductile Iron Pipe		
2.	Gate Valve M.J.		
3.	D.I.P. SpoolPiece Flg x Pe (10xDia.)		
4.	Meter Strainer		
5.	Propeller Meter		
6.	Flanged Coupling Adapter		
7.	Megalug Gland (Thrust Anchor)		
8.	Concrete Thrust Block P.I.P.		
9.	Concrete Vault		

NOTE:

- 1. Use Rowley pipe supports or equivalent as needed (See E-9-12-4).
- 2. Pipe support locations to be determined by field personnel.
- 3. All Sched. 40 Stl. pipe outside of vault to be wrapped w/10-20 Mil. Scotchwrap corrosion protection tape.
- 4. All mechanical joint fittings to are to be megalugged.
- 5. Use deflection fittings (45° Ells.) to achieve necessary depths & cover as shown on the standard specification for the installation of a concrete vault (E-9-12-5).

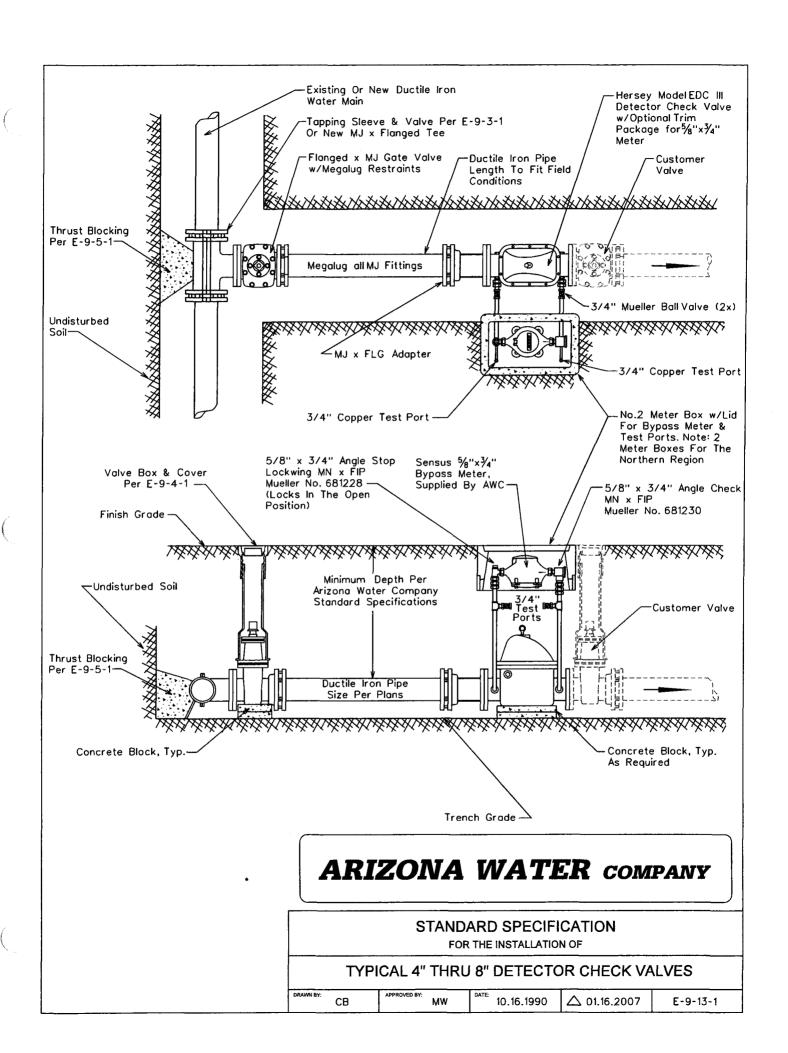
ARIZONA WATER COMPANY

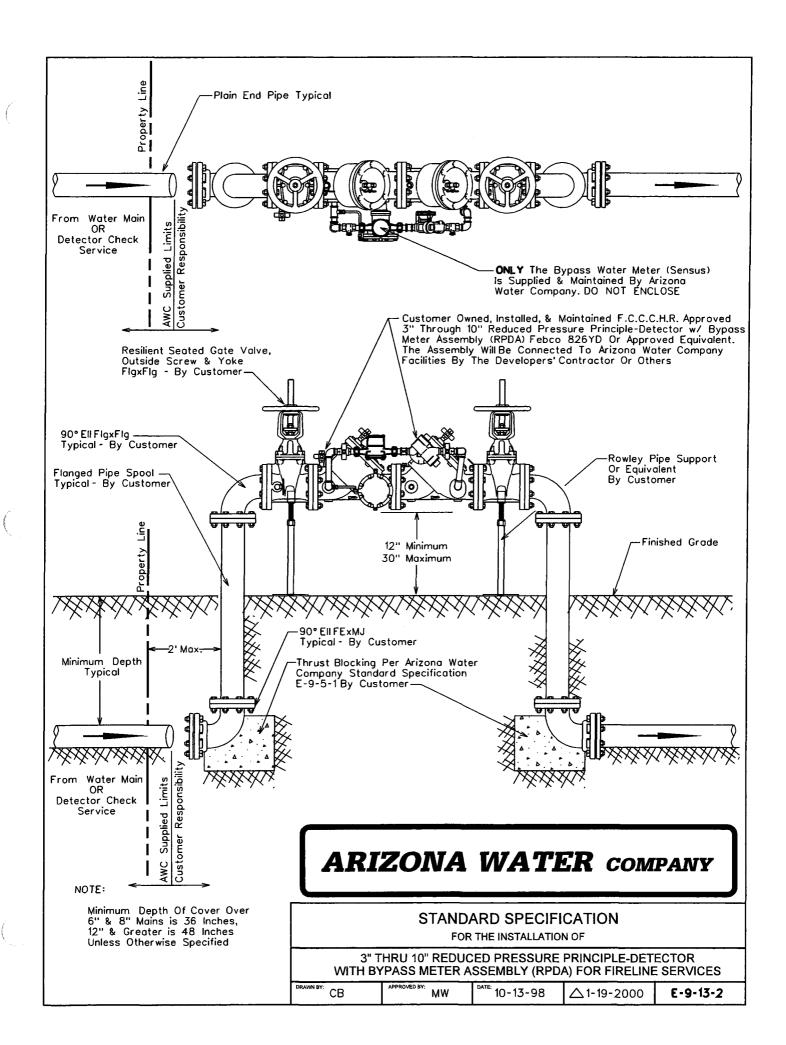
STANDARD SPECIFICATION

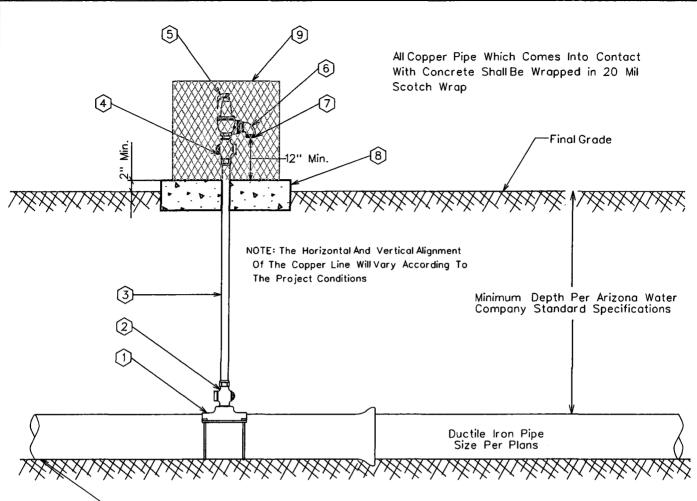
FOR THE INSTALLATION OF

NON-POTABLE PROPELLER METER

DRAWN BY: JPK APPROVED BY: MW DATE: 7-20-95 \(\triangle \) E-9-12-6







NOTE:

1. Pressure relief valves are typically located just down stream of a pressure reducing station or where system conditions might be subject to greater than allowable pressures.

-Trench Grade

2. The relief valve assembly and vandalenclosure shall be located out of the roadway, but within the right-of-way or easement.

0	FITTINGS SCHEDULE
1.	Mueller BR2B Bronze Service Saddle - Double Strap
2.	2" Mueller B-25008 Taper x Comp. Ball Corp Stop
3.	2" Type 'K' Copper w/NO Splices - Field Fit
4.	2" Mueller B-25028 IP x Comp. Ball Corp Stop
5.	2" Pressure Relief Valve Watts 174A With A 2" Inlet / 2" Outlet 30-150 psi W/ Bronze Body
6.	2" Brass Street Elbow
7.	No.16 Wire Mesh Screen (Non-Corrodible)
8.	4" Thick Concrete Pad - Class 'C' Concrete
9.	Vandal enclosure to be centered on the concrete pad

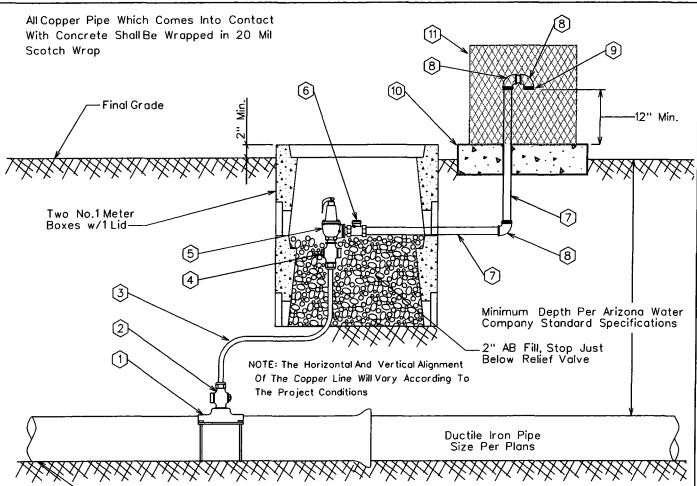
ARIZONA WATER COMPANY

STANDARD SPECIFICATION

FOR THE INSTALLATION OF

TYPICAL PRESSURE RELIEF VALVE ASSEMBLY

DRAWN BY: CCO APPROVED BY: MW DATE: 3/20/1986 △ 08.29.2006 E-9-14-1



NOTE:

-Trench Grade

- 1. Pressure relief valves are typically located just down stream of a pressure reducing station or where system conditions might be subject to greater than allowable pressures.
- 2. The relief valve assembly and vandal enclosure shall be located out of the roadway, but within the right-of-way or easement.

	FITTINGS SCHEDULE					
	FITTINGS SCHEDULE					
1.	Mueller BR2B Bronze Service Saddle - Double Strap					
2.	2" Mueller B-25008 Taper x Comp. Ball Corp Stop					
3.	2" Type 'M' Rigid Copper w/NO Splices - Field Fit					
4.	2" Mueller B-25028 IP x Comp. Ball Corp Stop					
5.	2" Pressure Relief Valve Watts 174A With A 2" Inlet / 2" Outlet 30-150 psiW/ Bronze Body					
6.	2" Bronze Check Valve Watts Series CV					
7.	2" Schedule 40 Cut Pipe - Field Fit					
8.	2" Brass Street Elbow					
9.	No.16 Wire Mesh Screen (Non-Corrodible)					
10.	4" Thick Concrete Pad - Class 'C' Concrete					
11.	Guardshack, Model GS-1, Available From BPDI, Inc. Available In Leaf Green Or Desert Tan					

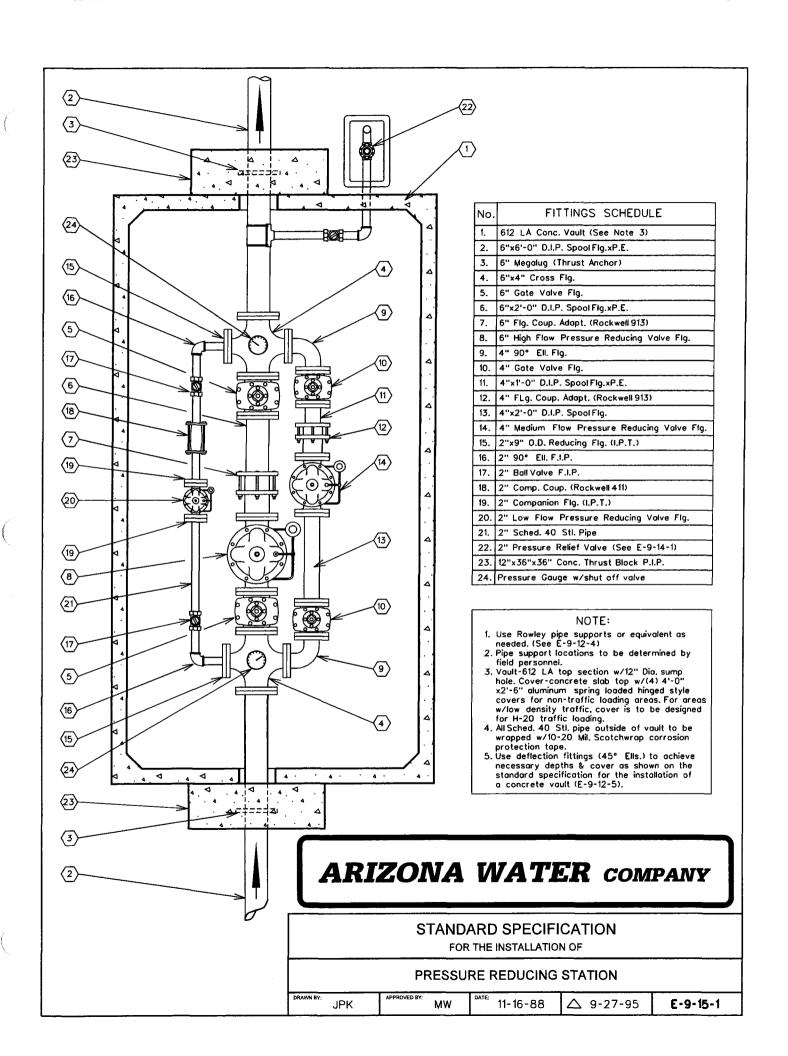
ARIZONA WATER COMPANY

STANDARD SPECIFICATION

FOR THE INSTALLATION OF

PRESSURE RELIEF VALVE - NORTHERN REGION

DRAWN BY: CCO APPROVED BY: MW DATE 3/20/1986 \(\triangle 08.29.2006 \) E-9-14-2



- 1. Specific Items To Be Painted Deer-O Pure White Enamel:
 - A. All Booster Pumps.
 - B. All Electrical Motors And Gas Engines.
 C. Well Pump Discharge Heads.
 D. Electrical Panel.
- 2. Specific Items To Be Painted Frost Cap White Or Deer-O Pure White Enamel:
 - A. Well Shelter.
- 3. Specific Items To Be Painted OSHA Orange:
 - A. Electrical Conduit.
- 4. All Other Items To Be Painted With Either: (At Manager's Discretion)

- A. Cholla Green
- B. Forest Green
 C. Sonora Beige
 D. Red Rock

- E. Rock Brown
 F. Deer-O Pure White
 G. Elkhorn Cactus

ARIZONA WATER COMPANY

STANDARD SPECIFICATION FOR THE INSTALLATION OF

PAINT COLOR SELECTION

APPROVED BY: 3/20/1986 △ 2/13/2001 E-9-16-1 ссо

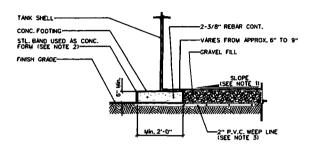
- 1. Tank shall conform to AWWA Specification 0100-84 with exceptions noted below.
- +2 1/4" minimum shell plots
- Minimum of 12" diameter roof vent, screened with No. 16 non-corradible wire mest, to be located on a 24" diameter round hinged manhole opening at the center of the tank to provide access to the dollar plate.
- Overflow pipe shall be the same diameter as the inlet pipe and shall terminate 12 to 24 inches above splash pad or a minimum of 2 overflow pipe diameters above weir box high water level.
- 5. Storage tank shallbe placed upon adequately compacted base material.
- 6. 6" minimum floor mounted tank drain outlet to be located close to the outer shell.
- Tank and related fittings shall be enclosed with a 6 foot chain link fence with lockable gates and anti-personnel wire on top of fence.
- 8. Liquid levelshall be indicated by a target and target board on the autside surface of the tank
- 9. 24 inch diameter manholes shall be provided on the roof and on the shellnear the bottom of the tank. The roof manhole cover shall overlop the manhole by at least 2 inches to provide a rain light closure. Roof manhole shall be hinged and equipped with a lock. Shellmanhole cover to be hinged and botted in place. "Tanks larger than a 60 foot diameter require 2 shell manholes.
- Inside and outside lodders shall be located at the roof markole. Outside lodder shall be coged with locking trop door. Bottom 8 feet of coge shall be enclosed to within '\(\frac{\chi}{2} \)" of shell with 10 gouge sheet steet.
- 11, Finished tank shall be disinfected in accordance with Arizona Department of Health Services Engineering Bulletin No. 8 before being placed into service.
- 12. The following information will be included with application for approval to construct:
- 13. The storage tank will not be constructed within the 100 year flood plain and the tank site will be graded to slope away from the tank.
- The welded steel storage tank will be coated as per AWWA Specification 0102, and N.S.F. Standard 61.

*Exceptions to AWWA Specification D100-84

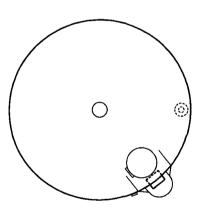
5. Method of water level control___

EQUIDATION NOTES

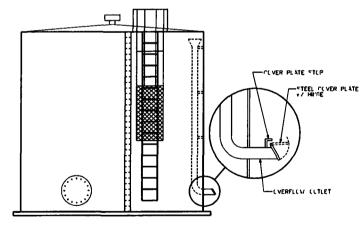
- 1. FINISH CONCRETE SURFACE MUST SLOPE UPWARDS FROM THE STEEL BAND APPROX. 1" IN 10'-O".
- 2. TOP OF STEEL BAND MUST BE MAINTAINED LEVEL TO WITHIN 1/4".
- 3. INSTALL 8-2" DIA.*10"-0" P.V.C. WEEP LINES, EQUALLY SPACED (EVERY 45"), PERFORATE 8"-0" OF LINE WITH 1/2" DIA HOLES # 6" O.C. PLUG INTERIOR END OF LINE W/2" CAP.



FOUNDATION DETAIL







PROFILE VIEW

ARIZONA WATER COMPANY

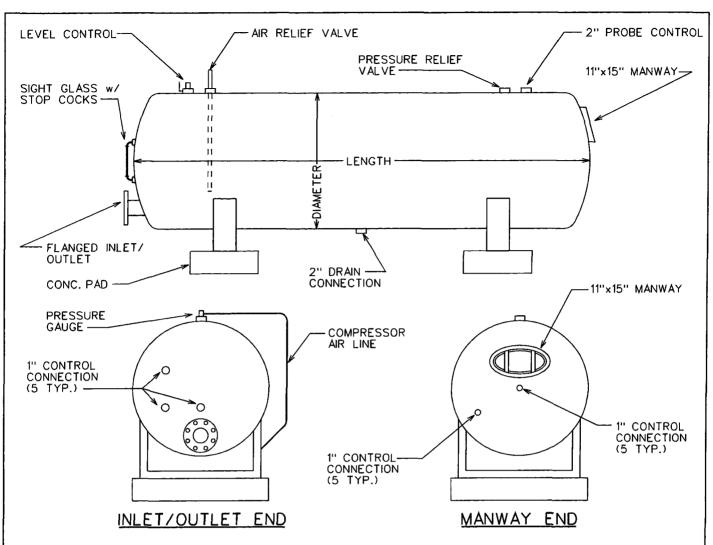
STANDARD SPECIFICATION

FOR THE INSTALLATION OF

STEEL WATER STORAGE TANK

E-9-17-1

DRAWN BY: JPK APPROVED BY: MJW DATE: 10-17-88 \(\triangle 2-12-96 \)



- 1. ALL HYDROPNEUMATIC TANKS SHALL BE DESIGNED & CONSTRUCTED IN ACCORDANCE WITH THE CURRENT REQUIREMENTS OF THE ASME CODE FOR UNFIRED PRESSURE VESSELS, SECTION VIII, DIVISION 1.
- 2. FINISHED TANK SHALL BE DISINFECTED IN ACCORDANCE WITH ADEQ BULLETIN No. 8 BEFORE BEING PLACED INTO SERVICE.
- 3. THE WELDED STEEL HYDROPNEUMATIC TANK WILL BE COATED AS PER AWWA SPECIFICATION D102 & NSF STANDARD 61.
- 4. THE FOLLOWING INFORMATION WILL BE INCLUDED WITH THE APPLICATION FOR APPROVAL TO CONSTRUCT.
- 1. Tank Location
- 2. Tank Length _____
- 3. Tank Diameter _____
- 4. Tank Capacity _____
- 5. Maximum Working Pressure ___

ARIZONA WATER COMPANY

NOT CONVERTED TO CAD

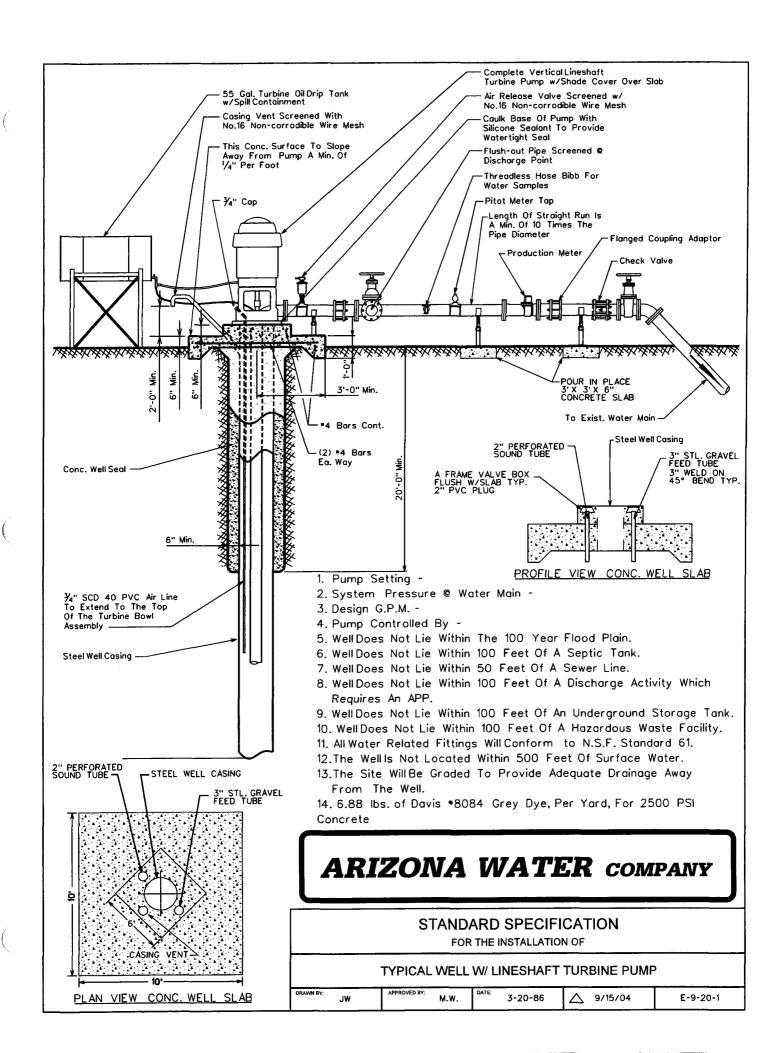
ARIZONA WATER COMPANY

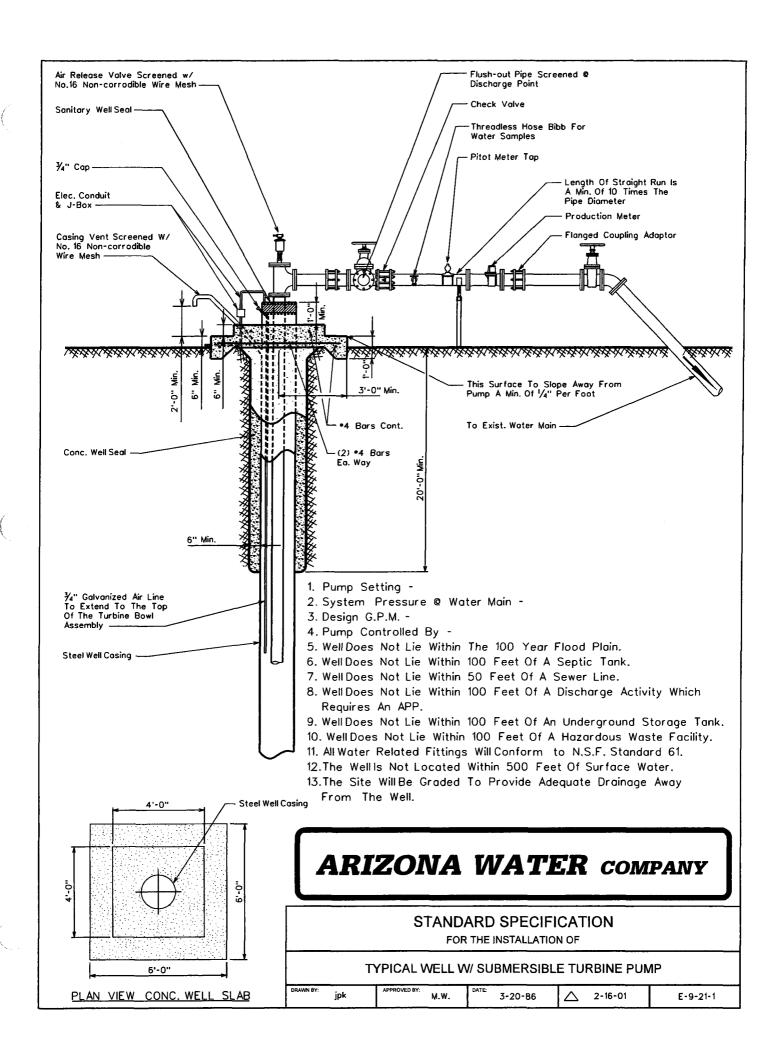
STANDARD SPECIFICATION

FOR THE INSTALLATION OF

WELL SHELTER

CB APPROVED BY: DATE 03.20.1986 \(\triangle 04.03.2001 \) **E-9-19-1**





All New Purchases To Conform To The Following:

Column Pipe

Oil Tube - Peerless Type

```
1\frac{1}{2}" O.D. - 14 Threads Per Inch Right Hand 2" O.D. - 12 " " " " " " 2\frac{1}{2}" O.D. - 10 " " " " " " 3" O.D. - 10 " " " " " " 4" O.D. - 10 " " " " " " " "
```

Line Shaft

```
3/4" O.D. - 10 Threads Per Inch Left Hand
1" O.D. - 14 " " " " "
1-3/16" O.D. - 10 " " " " " "
1-1/2" O.D. - 10 " " " " " "
1-11/16" O.D. - 10 " " " " " "
1-15/16" O.D. - 10 " " " " " " "
2-3/16" O.D. - 8 " " " " " "
```

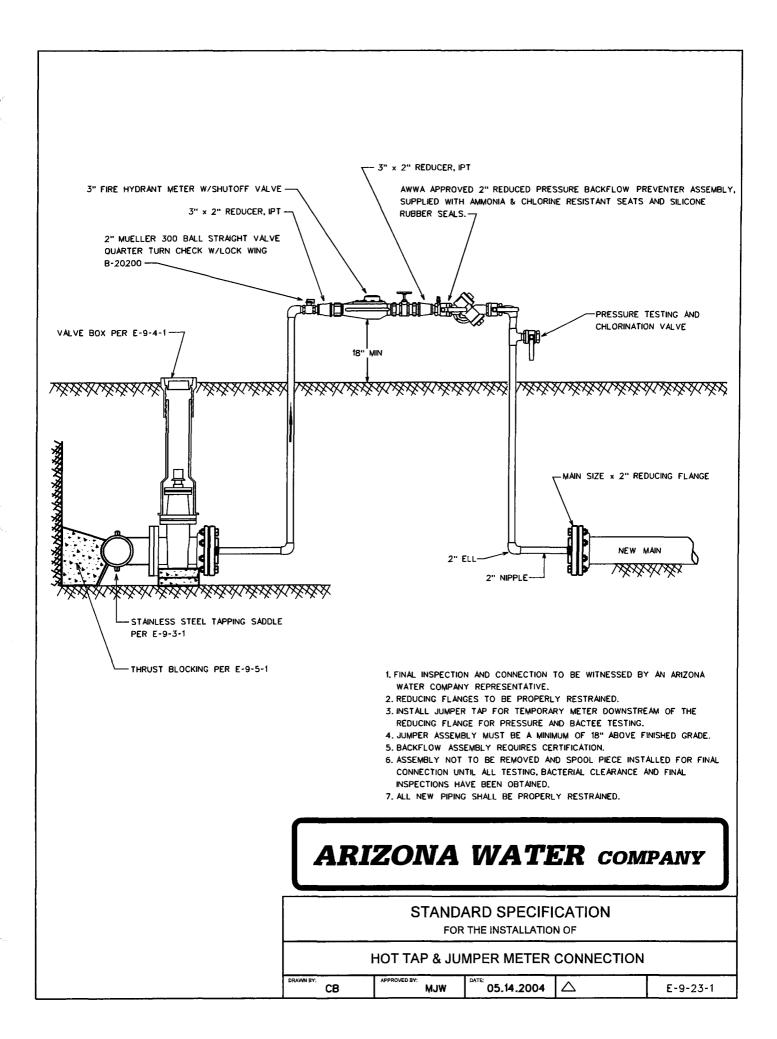
ARIZONA WATER COMPANY

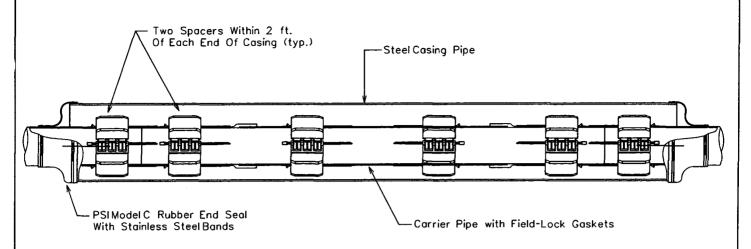
STANDARD SPECIFICATION

FOR THE INSTALLATION OF

COLUMN PIPE, OIL TUBE AND LINE SHAFT

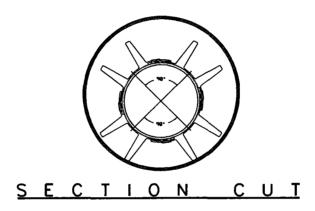
DRAWN BY: CCO APPROVED BY: DATE: 3/20/1996 △ 2/13/2001 **E-9-22-1**





CROSS SECTION

The casing spacers shall be the PSI Ranger II Casing Spacers as manufactured by Pipeline Seal and Insulator, Inc., Houston, Texas.



End Seals

After insertion of the carrier pipe into the casing, the ends of the casing shall be closed by installing 1/8" thick synthetic rubber end seals equal to the PSI Model "C" end seal as manufactured by Pipeline Seal and Insulator, Inc., Houston, Texas.

NOTE: The Carrier Pipe Shall Be Polywrapped Prior To The Skid Installation & Insertion Into The Carrier Casing For Divisions Requiring Polywrapped Pipe.

OD Push On Joint Bell	OD M.J. BELL
6" - 8.66"	6" - 11.12"
8" - 10.82"	8" - 13.37"
12" - 15.05"	12" - 17.94"
16" - 19.74"	16" - 22.56"
20" - 23.98"	20" - 27.08"
24" - 28.16"	24" - 31.58"
30" - 35.40"	30" - 39.12"
36" - 41.84"	36" - 46.00"
48" - 55.94"	48" - 60.00"

*Thickness Of Skid To Extend A Minimum of $\frac{1}{2}$ " Above The O.D. Of The Pipe Bell or Gland.

_					
PIPE SIZE	CASING SIZE	CASING SIZE ID	CASING SCHEDULE	WALL THICKNESS	SKID SIZE
6''	16''	15.25"	STD.	.375	*x4x12
8''	18''	18.25"	STD.	.375	≖x4x12
12''	22"	21.25"	STD.	.375	*x4x12
16''	28"	27.25"	STD.	.375	*x4x12
20"	32''	31.25"	STD.	.375	*x4x12
24"	36"	35.25"	STD.	.375	≖x4x12
30"	48"	47,25"	STD.	.375	≖x4x12
36''	54"	53.25"	STD.	.375	*x4x12
48"	66"	65.25"	STD.	.375	*x4x12

ARIZONA WATER COMPANY

STANDARD SPECIFICATION

FOR THE INSTALLATION OF

TYPICAL WATER LINE ENCAS	SEMENT
--------------------------	--------

DRAWN BY: CB	APPROVED BY:	3/20/1996	△ 09.27.2006	E-9-24-1

CALCIUM HYPOCHLORITE TABLET CHLORINATOR FEEDER SPECIFICATIONS

SCOPE - This specification describes a ARCH Chemicals Calcium Hypochlorite Tablet Chlorination System as manufactured by ARCH Chemicals, 501 Mentit Seven, P.O. Box 5204, Nonwalk, CT, 16865-5204,

DESCRIPTION - The chlorination system shall be completely assembled, ready to install. The chlorination system shall be a ARCH Chemicals Calcium Hypochlorire Tablet Feeder, or its equivalent, and shall be supplied with all its components factory mounted.

COMPONENTS - The Chlorination system shall have the following components: A=1.9% ARCH Chemical solid calcium hypochlorite tablet feeder

C. Orbentical metering pump C. Orloto pump control switch H. Waterproof electrical juricion box L. Orroson resistant scaledule 4D piping J. Reverse flow check valves K. Total solution output control valve

ELECTRICAL FIXTURES - The following electrical fixtures shall be provided:
A. Safety switch, 2 pole, fused for 30 Amps, for 120 Volts, 60 cycle, single phase power.

CHLORINATOR DESIGN - The chlorination facility shall be designed and constructed in accordance with Attorne State Department of Health Engineering Bulletin Number 8 - "Disinfaction of Water Systems". Latest Revision.

CHLORINATION EQUIPMENT - The chlorination equipment shall be a ARCH Chemicals Calclum Hypochlorite tables chlorinator; approved by NSF Standard 61.

CHLORINATOR OPERATION - The chlorination facility shall be operated in accordance with Arizona State Department of Health Engineering Bulletin Number 8, "Distribution of Water Systems", Table 1. Iatast ravision.

- ARCH Chemicals tablet chlorinator systems incorporate a patented chlorinator which is designed to tilitize ARCH Chemicals 1.% solid call proportionite lables (Approved NES Standard 60), Meets AWWA Stand 59.00, Meets AWWA Standard 60), Meets AWWA Standard 60), Meets AWWA Standard 60), Meets AWWA Standard 60), Meets ARCH Chemicals 1.268-1.179. The chlorinate is mounted on a polyer/lyene system enclosu. R. The intervalent is sprayed on the calcular hypocholinate bable and celebera in as addition table. This chlorinates soil metering pump is then adjusted to obtain the desired CL residual. CHLORINATOR SYSTEM DESCRIPTION - ARCH Chemicals tablet

ARCH Chemicals Calcium Hypochlorite Tablet Chlorinator

HYPOCHLORINATOR COMPONENTS

6. Inlet Shut-Off Valve
7. Inlet Pressure Regulator
8. Inlet Water Pressure Gauge
9. Spray Nuzzle Water Pressure
10. Inlet Strainer
11. Inlet Tubing Connection Chemical Metering Pump
 Pump Suction Connection
 Pump Discharge Connection
 Inlet Water Assembly
 Inlet Water Solenoid Valve

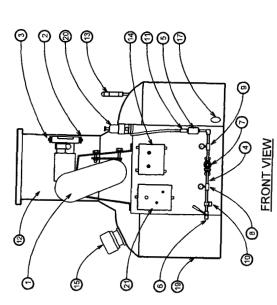
12. Dry Chemical Hopper
3. suction Line
14. Electrical Confort Box With Power On/Off
Electric Mischarge Connection
16. Solution Distrange Connection
17. Tank Drian Valve 25.4.6.6.7

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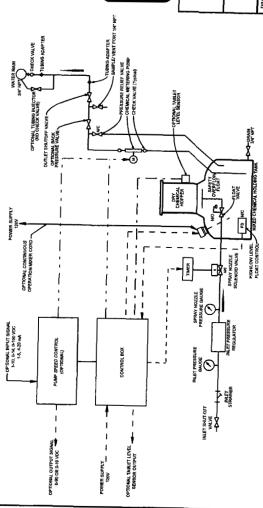


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TOP VIEW
HOPPER REMOVED FOR CLARITY

Chlorinator Fluid Schematic

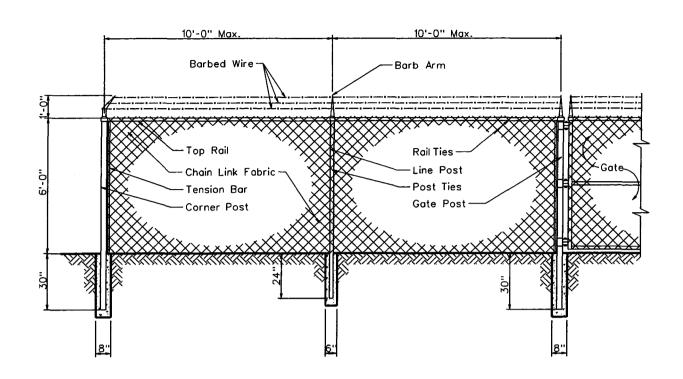


ARIZONA WATER COMPANY

STANDARD SPECIFICATION FOR THE INSTALLATION OF

CALCIUM HYPOCHLORITE TABLET CHLORINATOR

		E-9-25-1
	<	1
DATE	02-09-2000	
APPROVED BY:	MW	
DRAWN BY:	g 2	



Line Post: 1-7/8" O.D. 1.74 lbs. P/L.F. ASTM A-256 End Post: 2-7/8" O.D. 4.64 lbs. P/L.F. ASTM A-256 4.64 lbs. P/L.F. Corner Post: 2-7/8" O.D. ASTM A-256 Gate Post: 2-7/8" O.D. 4.64 lbs. P/L.F. ASTM A-256

4.64 lbs, P/L.F.

Chain Link Fabric: 9 Ga. 2" Mesh Galv. Before Weave

1-5/8" O.D.

Selvage: Barb/Knuckle

Fittings: Pressed Steel

Barb Wire: 2-1/2 Ga./2 Point

Barb Arm: 1 Piece/45° Arm

Tension Wire: 9 Ga./Galv.

Top Roil:

Line Post Set: 6"x24" In Concrete

Terminal Post Set: 8"x30" In Concrete

ARIZONA WATER COMPANY

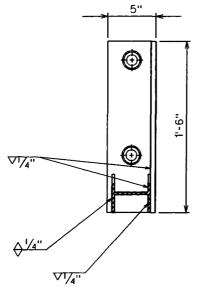
ASTM A-256

STANDARD SPECIFICATION FOR THE INSTALLATION OF

CHAIN LINK FENCE

E-9-26-1

CCO APPROVED BY: MW DATE: 7/7/1992 \(\triangle 2/9/2001 \)

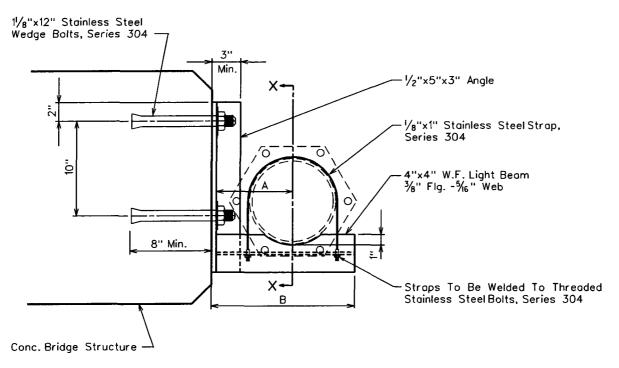


SECTION X-X

NOTES

- Minimum 2 Supports Per Joint Of Pipe.
- 2. All Bolts Shall Have A Lock Washer Under The Nut.
- 3. All Nuts Shall Be Stainless Steel Series 304.

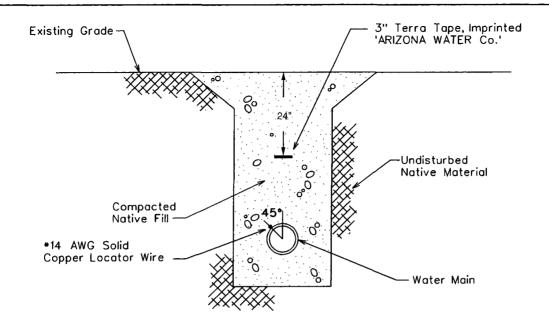
PIPE SIZE	A	В
8''	8"	15''
10"	9"	17''
12"	10"	19"



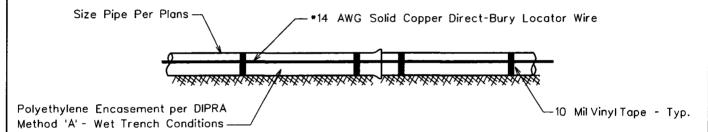
SUSPENSION DETAIL

ARIZONA WATER COMPANY

			D SPECIF		
	SIDE H	IUNG WA	TER LINE	SUSPENSIO	N
DRAWN BY: JP	APPROVED B	MJW DATE	7-12-96	Δ	E-9-27-1



TYPICAL WATER TRENCH DETAIL



TYPICAL PROFILE VIEW

WIRE GENERAL NOTES:

- 1. All pipe shall have *14 AWG Solid Copper Direct-Bury Locator Wire Installed Directly To The Polywrap At 45° From The Vertical Center Of The Pipe and Shall Be Attached Using 10 Mil Vinyl Tape.
- 2. The Locating Wire Shall Terminate At the Top Of Each Valve Box and Be Capable of Extending 12" Above the Top Of The Box In Such A Manner So As Not To Interfere With Valve Operation.

TAPE GENERAL NOTES:

- 1. Use Terra Tape 3" Marking Tape As Manufactured By Reef Industries Inc. Of Houston, Texas (1-800-231-2417)
- 2. The Tape Is Blue & Imprinted 'ARIZONA WATER Co.'
- 3. INSTALLATION: The Pipe Warning Tape Shall Be Installed Over All Water Mains And Shall Be Buried 24 Inches Below The Surface Over The Center Of The Pipe.
 A) The Backfill Shall Be Sufficiently Leveled So That The Tape Is Installed On A Flat Surface.
- B) The Tape Shall Be Centered In The Trench With The Printed Side Up.
- C) Care Shall Be Exercised To Avoid Movement Of The Tape While The Remaining Backfill Is Moved Into The Trench.

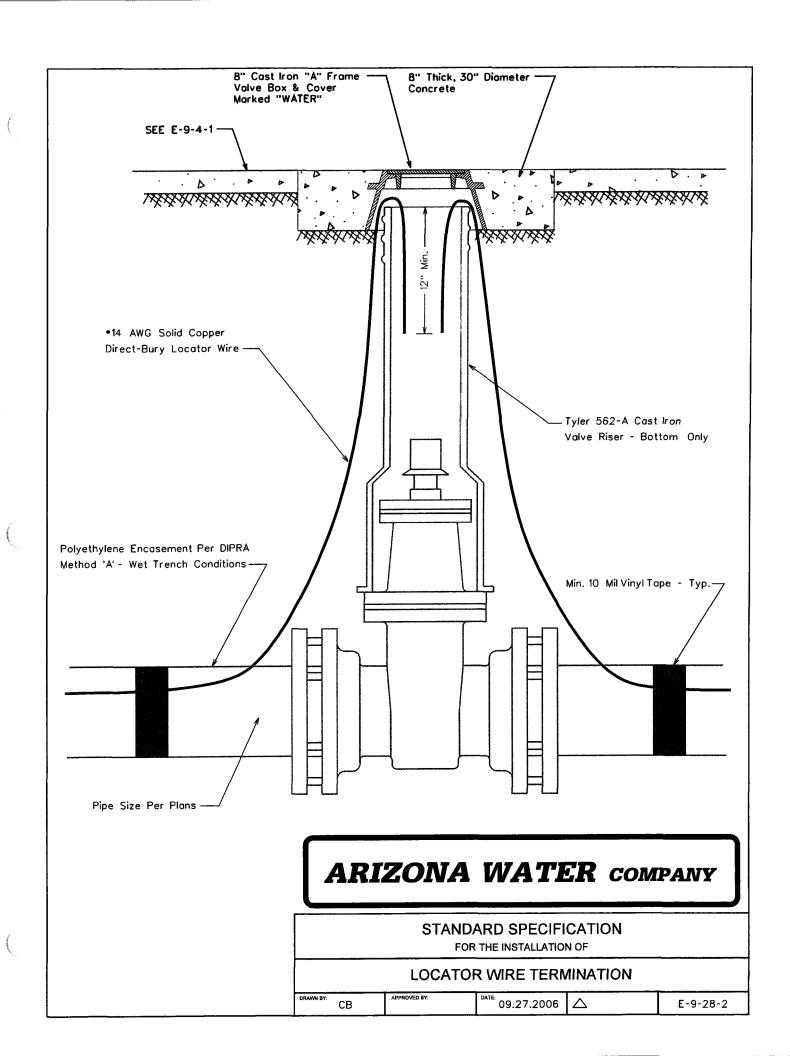
ARIZONA WATER COMPANY

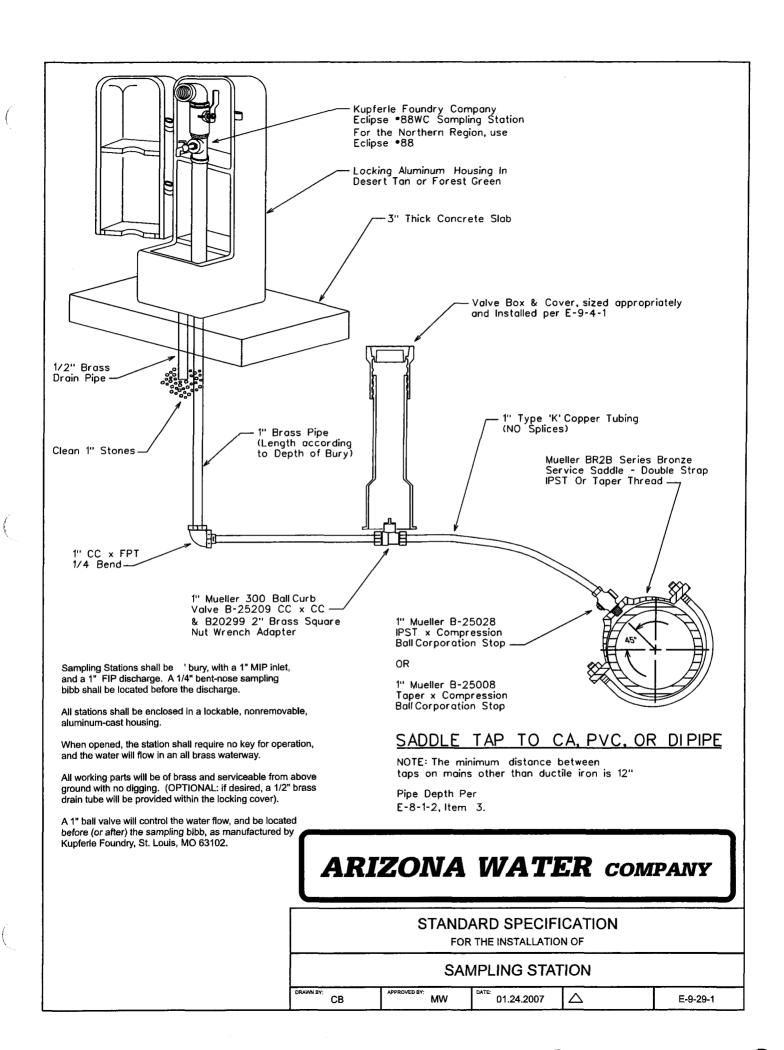
STANDARD SPECIFICATION

FOR THE INSTALLATION OF

PIPE WARNING TAPE AND LOCATOR WIRE

DRAVN BY: CB APPROVED BY: DATE 03.24.1997 \(\triangle 09.27.2006 \) E-9-28-1





Z-CORR DIGITAL LOGGERS

- EASY TO SURVEY LARGE PORTIONS OF A WATER SYSTEM
- BENEFICIAL FOR OVERNIGHT DEPLOYMENT, THUS REDUCING THE CHANCE OF OUTSIDE INTERFERENCE/NOISE
- DATA, INCLUDING AUDIO RECORDING OF POSSIBLE LEAK, STORED ON LAPTOP FOR FUTURE REFERENCE
- POSITIVE RESULTS FROM THE THREE SETS OF Z-CORR DIGITAL LOGGERS CURRENTLY IN USE IN OTHER COMPANY SYSTEMS

S30 SURVEYOR LEAK NOISE AMPLIFICATION SYSTEM

- WORKS WELL ON VARIOUS CONTACT POINTS OF A DISTRIBUTION SYSTEM, AND AS ONE WOULD USE A REGULAR GROUND MICROPHONE
- ELECTRONIC SOUND AMPLIFICATION OF POSSIBLE LEAK NOISE
- COMPLEMENTS THE COMPANY'S OTHER LEAK DETECTION EQUIPMENT (Z-CORR & LC2500 CORRELATOR)
- COMPANY HAS HAD POSITIVE RESULTS WITH EARLIER VERSIONS OF THIS TYPE OF LEAK DETECTION EQUIPMENT

Advanced Digital Leak Detection System

flow Metrix, Inc.

Analysis

Auto Analysis: **ZCOT7** automatically correlates data among all DCLs, pinpointing the map locations of any leak sounds present. Click on any pair of DCLs to see the leak noise correlation.

Listen.

ZCOT7 lets you listen to actual nighttime recorded leak sounds. Click on any logger symbol or leak index bar to hear the leak sound at that map location.

Correlation Results:

Click on any thumbnail image to get a detailed analysis: pinpoint multiple leaks; enter pipe information; see logger and leak locations on map.

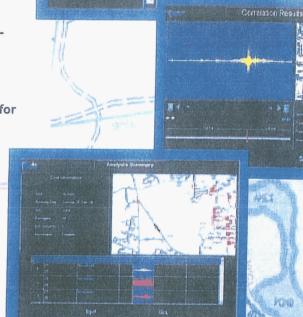
Summary:

Shows a zone map with all DCLs and a summary table with all significant correlations and exact locations of pinpointed leak noises.

Report:

Prints a full report of the \mathbb{Z} **co**?? analysis for the entire zone.





10077 ... the Digital Correlating Logger

Will Stay on



Feature	Zco77	Conventional Noise Loggers	Permanently Installed Noise Loggers
Pinpoints leak	Yes	No	No
Actual audio recording	Yes	No	No
Upgradeable/Reprogrammable	Yes	No	No
Digital mapping	Yes	No	No
Identifies multiple leaks	Yes	No	No
Communication mode	Internet/Docking Station	Docking Station	Drive-by Radio



Lco?? 21st century leak detection

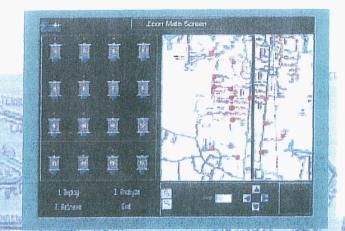
Planning

Now you can truly be in control of your leak detection program... all from your desktop or field computer.

ZCO37 is a network of Digital Correlating Loggers (DCLs) which pinpoint the exact locations of any leaks in one overnight surveillance. The easy-to-use 2007 software revolutionizes the ease and accuracy of pipeline leak detection and pinpointing.

ZCO77 lets the leak detection manager plan the placement of the ZCO77 DCLs and analyze and review the overnight recording results - all from the comfort and convenience of the office!





Deployment

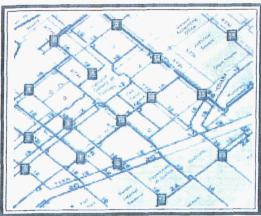
ZCO37 is flexibly designed for a variety of deployment strategies:

- One night one zone
- Multiple nights one zone
- Multiple nights multiple zones

Deployment is planned by you, either in the office or in the field, working from your distribution system maps.

Work Order No. 21

Zone: A DCLs: 1-16 Deploy: 08/01/00 Retrieve: 08/02/00



Logger No.	A diffess	Deployed by (Initials):	Retrieved by (initials):
1	Valve 22 @ 8th Avenue & I Street		
2	Valve 26 @ 6th Avenue & H Street		
3	Valve 17 @ 8th Avenue & G Street		
4	Valve 23 @ 10th Avenue & H Street		

Sample Deployment Scenario

Start:

Enter the location of each Digital Correlating Logger (DCL); navigate the digitized map and click to place DCL at its location. DCLs are typically placed 400 to 4,000 feet apart depending on the environment.

finish:

A printed **Zco77** Work Order directs field personnel to place DCLs on specific valves or other pipe fittings.

The next morning field personnel replace the DCLs in their Docking Station. The Docking Station connects to your desktop PC, laptop, or rugged mobile computer via a USB or serial link.

lloumload:

Nighttime data recorded by the DCLs is transferred to the PC; permanently stored; and analysis is automatically performed, pinpointing the locations of any leaks present.

Technical Specifications

Digital Correlating Logger (DCL)

Enclosure: Aluminum, cylindrical **Protection:** IP68 – fully submersible

Weight: 1 lb (450 grams)

Dimensions: Height = 4.5 inches (11.4 cm) Diameter = 2.25 inches (5.7 cm)

Mounting: Magnet, 40 lbs (18 kg) pull force **Operating temperature range:** -20 to +140°F

(-30 to +60°C)

Power Source: Lithium battery, 5-year life, factory-replaceable, non-rechargeable

Sensor: High resolution electronic accelerometer;

Shockproof to 6,000 g; Sensitivity - 1 V/g; Resolution - 0.25 $\mu g / V$ Hz

Data Acquisition: Frequency range: 1-3,000 Hz;

Signal range: sub 1 μg – 20 mg; Digital Resolution: 20 bits

Docking Station

Enclosure: Rugged ABS carrying case **Protection:** IP68 - closed; IP65 - open **Weight:** 15 lbs (6.8 kg) without DCLs **Dimensions:** 20.5 x 16.75 x 8.5 inches

(52 x 42 x 22 cm)

Operating temperature range: 20 to 140°F

(-5 to +60°C) Capacity: 3 to 16 DCLs PC link: RS-232 or USB

Product Features

- **ZCOT7** DCLs are locally intelligent. They feature auto-power management (have no on/off switch) and never require user intervention.
- **Zco+7** software has a familiar web browser interface, making it as easy to use as a remote control.
- The **Zco++** system is expandable from 3 to an unlimited number of DCLs so it can grow with your leak detection program.
- With Zcorr a manager can run a leak detection program across pipeline networks anywhere in the world. DCLs can be transported ready to deploy, or setup and deprogrammed remotely, with data access and analysis by internet or email.
- **Zcorr** is fully upgradeable through software, making the latest technical advances available to all users.

For more information contact:

flow Metrix, Inc.

Two Clock Tower Place Suite 425 Maynard, MA 01754 800.517.4737 (toll-free) 978.897.2033 978.897.2497 (fax) www.flowmetrix.com

S30 Surveyor

Leak Noise Amplification System

A leaking pipe produces a distinct noise that travels along the pipe, through the water and sometimes to the surface. An operator using the S30 can listen at various contact points (valves, hydrants etc) to determine whether or not the pipe is leaking. To do this, the operator places the AX80 sensor in contact with any access point in the distribution system. When the S30 is turned on, the console amplifies the sound so that the user can hear the noise through the supplied aviator quality headphones. The analog meter gives an indication of the noise intensity in the pipe and, by listening at several points in a given area, an operator can localize the general location of a leak.



Downtown leak survey on main line valve

Residential Leak survey

Leak pinpointing by surface sounding

The S30 can also be used in a similar way to a ground microphone. By attaching the surface sounding plate to the AX80, the user can run the AX80 along the ground above the pipe. By using the S30 to locate the spot where the noise is loudest, the operator can pinpoint the location of the leak











For more information call (513) 831-9335 or visit www.fluidconservation.com





KEY BENEFITS

Adjustable Analog Meter - Allows for easy comparisons of noise level at neighboring access points. Sensitivity can be adjusted for improved results in areas with high noise levels.

Manual Volume Control - Provides full control over volume levels to enhance listening.

Meter backlight - Allows for enhanced viewing at night.

enhanced viewing at night.

Aviator-Quality Headphones -

Provides for optimum sound quality, ensuring that the maximum number of leaks are heard.

Lightweight Console - Comfortable to use for several hours at a time.

Push Button On/Off - Allows for easy operation with gloves on.

Custom Suitcase with Belt -

Protects equipment for easy carrying. **Backed by FCS** - Full one year on parts and labor. The resources of our sales, repair and training departments are available for the life of the S30.

DATA LOGGING

S30 Surveyor

Leak Noise Amplification System

Dimensions	Width 4" Depth 1.5" Length 7.5"		
Weight	1.8 lbs		
Gain Control	Manual		
Power Supply	2 - 9V batteries		
Meter	Analog w/backlight		
Accelerometer Sensitivity	12 V/G		
Frequency Response	30 Hz to 5 kHz (-3dB)		
Warranty	1 year parts and labor		





FCS reserves the right to change the specification of any product without prior notice.

Fluid Conservation Systems

a Division of Palmer Environmental
502 TechneCenter Drive, Suite B, Millord, Ohio 45150 USA
Tel: (513) 831-9335/(800) 531-5465 Fax: (513) 831-9336
fcsinto@fluidconservation.com
www.fluidconservation.com



Docket No. W-01445A-10-0517

2010 RATE HEARING (AMENDED)

For Test Year Ending 12/31/10

PREPARED
DIRECT TESTIMONY & EXHIBITS
OF

Thomas M. Zepp

1		TABLE OF CONTENTS	
2	I.	INTRODUCTION AND QUALIFICATIONS	
3	n.	PURPOSE OF TESTIMONY, PRINCIPLES, SUMMARY AND CONCLUSION4	
4	Ш	COST OF EQUITY ESTIMATES BASED ON THE DCF MODEL13	
5	IV.	COST OF EQUITY ESTIMATES BASED ON CAPM AND	
6		RISK PREMIUM ANALYSES21	
7	V.	ADDITIONAL BUSINESS RISKS OF ARIZONA WATER29	
8	VI.	SUMMARY AND CONCLUSIONS41	
9			
10	<u>EXHIBITS</u>		
11		RESUMETMZ-1	
12		TABLES 1 THROUGH 20TMZ-2	
13		QUARTERLY REVIEW OF ECONOMICS AND FINANCE ARTICLETMZ-3	
14		SELECTED PAGES FROM TESTIMONY FILED BY THE DRA	
15		OF THE CALIFORNIA PUC IN APPLICATION NO. 09-05-001TMZ-4	
16			
17			
18			
19			
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ARIZONA WATER COMPANY

Direct Testimony of

Thomas M. Zepp

١. **Introduction and Qualifications**

PLEASE STATE YOUR NAME AND ADDRESS. Q.

Α. My name is Thomas M. Zepp. My business address is Suite 250, 1500 Liberty Street, S.E., Salem, Oregon 97302.

Q. WHAT IS YOUR PROFESSION AND BACKGROUND?

I am an economist and Vice President of Utility Resources, Inc., a consulting firm. URI provides economic and financial studies related to utility services, as well as valuations of utilities, oil wells, gas wells and other properties for various clients in court cases and administrative proceedings. I received my Ph.D. in Economics from the University of Florida. Prior to jointly establishing our consulting firm in 1985, I was a consultant at Zinder Companies from 1982-1985 and a senior economist on the staff of the Oregon Public Utility Commissioner (now Commission) between 1976 and 1982. Prior to 1976, I taught business and economics courses at the graduate and undergraduate levels.

I have been deposed or testified on various topics before regulatory commissions, courts and legislative committees in twenty-two states, before two Canadian regulatory authorities and before four Federal agencies. In addition to cost of capital studies, I have testified as to incremental costs of energy and telecommunications services, values of utility properties, and appropriate rate designs.

WHAT PREVIOUS COST OF CAPITAL STUDIES HAVE YOU PREPARED? Q.

Α. I have submitted studies or testified on cost of capital and other financial issues before the Interstate Commerce Commission, Bonneville Power Administration, and courts or regulatory agencies in Alaska, Arizona, California, Hawaii, Idaho,

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Illinois, Kentucky, Montana, Nevada, New Mexico, Oregon, Tennessee, Utah, Washington and Wyoming.

My studies and testimony have included consideration of the financial health and fair rates of return for Arizona Water Company ("Arizona Water" or the "Company") as well as Nevada Bell Telephone, Illinois Bell Telephone, General Telephone of the Northwest, Pacific Northwest Bell, U S WEST, Alaska Electric Light and Power, Alaska Power Company, Anchorage Municipal Light & Power. Commonwealth Edison, Idaho Power, Iowa-Illinois Gas and Electric, Northern Illinois Gas, Pacific Power & Light, Portland General Electric, Puget Sound Power & Light, Cascade Natural Gas, Mountain Fuel Supply, Northwest Natural Gas, Anchorage Wastewater Utility, Anchorage Water Utility, Arizona-American Water Company, California-American Water Company, California Water Service, Chaparral City Water Company, Dominguez Water Company, Golden State Water Kentucky-American Company, Hawaii-American Water Company, Water Company, Mountain Water Company, New Mexico-American Water Company, New Mexico Utilities, Inc., Oregon Water Company, Paradise Valley Water Company, Park Water Company, San Gabriel Valley Water Company, San Jose Water Company, Southern California Water Company, Suburban Water System, Tennessee-American Water Company and Valencia Water Company. I have also prepared estimates of the appropriate rates of return for a number of hospitals in Washington, a large insurance company, and U.S. railroads.

Q. DO YOU HAVE OTHER PROFESSIONAL EXPERIENCE RELATED TO COST OF CAPITAL OR COST OF EQUITY ISSUES?

A. Yes. My article, "Utility Stocks and the Size Effect - Revisited," was published in the *Quarterly Review of Economics and Finance*, Vol. 43, Issue 3, Autumn 2003, pp. 578-582. This article is attached as Exhibit TMZ-3. Also, I published an article entitled "Water Utilities and Risk," *Water, the Magazine of the National Association*

of Water Companies, Vol. 40, No. 1, Winter 1999, and was an invited speaker on the topic of risk of water utilities at the 57th Annual Western Conference of Public Utility Commissioners in June 1998. I presented a paper "Application of the Capital Asset Pricing Model in the Regulatory Setting" at the 47th Annual Southern Economic Association Conference, and published an article "On the Use of the CAPM in Public Utility Rate Cases: Comment," in *Financial Management*, Autumn, 1978, pp. 52-56. I have been a journal referee for *Financial Management* and the *International Review of Economics and Finance*. While on the staff of the Oregon PUC, I also established a sample of over 500,000 observations of common stock returns and measures of risk, and conducted a number of studies related to the use of various methods to estimate costs of equity for utilities. I was invited to Stanford University to discuss that research in 1980. Exhibit TMZ-1, attached, provides a more complete description of my past experience.

- II. Purpose of Testimony, Principles, Summary and Conclusion
- Q. WHAT IS THE SUBJECT OF YOUR TESTIMONY IN THIS PROCEEDING?
- A. I have determined the cost of equity for Arizona Water in this proceeding. My study is based on market data available to investors in early November 2010.
- Q. PLEASE DESCRIBE GENERALLY THE APPROACH AND GUIDING PRINCIPLES YOU FOLLOWED IN DEVELOPING THE COST OF EQUITY RECOMMENDATIONS YOU PRESENT IN THIS CASE.
- A. I selected appropriate approaches with the goal of reaching a recommended rate of return that is fair to both the Company and its ratepayers. In working through the processes required for each of the various methodologies I employ, I approach each choice that requires judgment and experience by making choices that are the most likely to reflect actual circumstances so that the results of the analyses are reliable indicators of the cost of equity for Arizona Water.

Q. WHAT STEPS DID YOU TAKE TO MAKE YOUR ESTIMATES OF THE COST OF EQUITY?

A. I took the following three steps to make my estimates of the cost of equity:

STEP 1: I first determine the cost of equity for a sample of seven publicly-traded water utilities with the discounted cash flow ("DCF") model, the capital asset pricing model ("CAPM") and two versions of the risk premium ("RP") model, which provide checks on the CAPM estimates. Consistent with past Arizona Corporation Commission ("ACC") or ("Commission") Decisions, I give a 50 percent weight to the DCF estimates and a 50 percent weight to the CAPM estimates. I conclude that the appropriate cost of equity for the sample group of water utilities in this proceeding falls in a range of 10.9 percent to 12.3 percent. The application of Step 1 is discussed in detail in Sections III and IV below.

STEP 2: I next determine a risk premium to compensate Arizona Water for its additional business risks. In Section V, I address the specific additional business risks faced by Arizona Water. My assessment of the specific additional business risks is based on the following:

- (a) The Size of the Company. Based on three measures of size, Arizona Water is smaller than each of the water utilities used to determine benchmark equity costs, and is between 8 percent and 11 percent as large as the average water utility in the sample. Smaller water utilities are more risky than larger ones, and thus investors would conclude that an equity investment in Arizona Water is more risky due to its comparatively smaller size.
- (b) Use of Historical Test Year. The Company faces risk that stems from the use of an historical test year with limited opportunities for out-of-period adjustments.
- (c) Risk Relative to Other Companies. For this risk I rely on an analysis presented by the California PUC Division of Ratepayer Advocates ("DRA") Staff in

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which two measures of relative risk are used to determine risk premiums the DRA Staff recommended for water utilities in a 2009 generic Return On Equity ("ROE") case.

Based on these observations and analyses, and my professional experience and judgment, I determine that the additional business risks faced by Arizona Water increase its cost of equity by no less than 50 basis points above the ROE required by a sample of seven publicly traded water utilities (the "water utilities sample") used to make benchmark equity cost estimates.

STEP 3: Finally, from the results of Steps 1 and 2, I determine the cost of equity for Arizona Water. I conclude the cost of equity for the Company falls in a range of 11.4 percent to 12.8 percent, and that the mid-point of that range of 12.1 percent is a reasonable required rate of return on equity for Arizona Water. The application of Step 3 is discussed in detail in Section VI below.

Q. HAVE YOU PREPARED ANY EXHIBITS TO ACCOMPANY YOUR TESTIMONY?

A. Yes. I have prepared four exhibits, which are attached to this testimony:

Exhibit TMZ-1 is my resume.

Exhibit TMZ-2 contains 20 tables that support my testimony. Generally, I refer to the pages in Exhibit TMZ-2 as Tables 1 through 20.

Exhibit TMZ-3 is the *Quarterly Review of Economics and Finance* article I wrote, referenced above, that addresses the issue of smaller utilities being more risky than larger ones.

Exhibit TMZ-4 is selected pages from testimony filed by the DRA of the California PUC in Application No. 09-05-001.

Q. PLEASE DISCUSS WHAT IS MEANT BY A FAIR RATE OF RETURN.

A fair rate of return is what is achieved when a utility has rates and rate adjustment mechanisms that allow owners of the utility a reasonable opportunity to recover the cost of providing service and to earn their cost of equity. The cost of equity of an

28

enterprise is measured by the rate of return that funds invested in a particular utility's equity could earn if such funds were invested elsewhere in an equally risky asset. In 1923, the U.S. Supreme Court set forth the following standards concerning fair rates of return in the *Bluefield Waterworks* decision:

A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties; but it has no constitutional right to profits such as are realized or anticipated in highly profitable enterprises or speculative ventures. The return should be reasonably sufficient to assure confidence in the financial soundness of the utility should be adequate. under efficient and management, to maintain and support its credit and enable it to raise the money necessary for the proper discharge of its public duties. A rate of return may be reasonable at one time and become too high or too low by changes affecting opportunities for investment, the money market and business conditions generally. 262 U.S. 679, 692-93 (1923).

In the *Hope Natural Gas* decision issued in 1944, the U.S. Supreme Court stated the following regarding the return to owners of a company:

[T]he return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital. *Hope Natural Gas* 320 U.S. 591, 603.

In 1989, in *Duquesne Light Co. v. Barasch*, the U. S. Supreme Court also recognized two important economic concepts related to fair rates of return. First, it found that the cost of common stock was related to fair rates of return ". . . the return required to sell such stock upon reasonable terms in the market." 488 U.S. at 310, n. 7. The source of funds that would be used to buy shares of common stock, however, does not change the cost of equity. The owners of the utility could be individuals who bought stock on margin, or bought it with 100 percent of their

own funds. Owners could also be a partnership, a developer, a holding company or some other type of entity. The status of the owners of the stock does not change the underlying cost of equity. For companies that have no publicly-traded common stock, like Arizona Water, as well as those that do, the U. S. Supreme Court has stated that the test of a fair rate of return is tied to the issue of new shares of common stock.

Second, the U. S. Supreme Court found that regulatory commissions may need to adjust the risk premium element of the rate of return to provide a fair return. It stated:

[W]hether a particular rate is "unjust" or "unreasonable" will depend to some extent on what is a fair rate of return given the risks under a particular rate setting system 488 U.S. 299, 310.

Therefore, in determining an appropriate rate of return, consideration must be given to the specific risks created by the nature and degree of regulation to which the utility is subject, in addition to examining general economic and financial data for utilities. To meet this requirement, the additional risk faced by Arizona Water should be recognized when setting the fair rate of return for the Company.

- Q. IS THERE A PARTICULAR RATE SETTING SYSTEM USED IN ARIZONA THAT SHOULD BE RECOGNIZED WHEN SETTING ARIZONA WATER'S AUTHORIZED ROE?
- A. Yes. The Arizona Constitution, Arizona appellate court decisions and the Commission's policies and practices have created a particular rate-setting system that limits the ability of Arizona utilities to earn a fair return on the value of their property devoted to public service. Specifically, the Commission's method of rate-setting uses historic test periods with limited opportunities to make appropriate out-of-period adjustments and has limitations on recovery of unavoidable, prudently incurred, costs without going through a full general rate case ("GRC"). Similar

limitations on rate-setting systems are not required in jurisdictions, such as California and Pennsylvania, which use forecasted or projected test periods to determine rates and have other rate-adjustment mechanisms that allow utilities to recover prudent costs incurred on behalf of ratepayers. This is not to say that Arizona's mechanisms are wrong, but only that the equity market would adjust its expected rate of return in recognition of these factors.

- Q. DOES THIS RATE-SETTING SYSTEM REQUIRE AUTHORIZED ROES FOR ARIZONA WATER TO BE HIGHER THAN THE COST OF EQUITY FOUND TO BE REASONABLE FOR WATER UTILITIES OPERATING IN OTHER JURISDICTIONS?
- A. Yes. Investors expect a reasonable opportunity to earn the cost of equity on average. With the particular rate setting system in Arizona, however, investors can expect to earn less than the cost of equity on average unless the authorized ROE is increased by enough to give the investors a reasonable opportunity to earn the target cost of equity, and that increased ROE therefore becomes the utility's cost of equity for rate making purposes.

Even if Arizona Water's cost of equity were the same as the cost of equity of the water utilities sample, the Company does not have as good an opportunity to earn that cost of equity as the utilities in the water utilities sample that are regulated under more flexible rate-setting systems. As a result, Arizona Water's authorized ROE should be increased by an amount that gives the Company the same opportunity to earn its cost of equity as is available to the benchmark water utilities operating under more flexible rate-setting systems. This result is consistent with the holding in Duquesne Light Co., discussed above. By authorizing an appropriate risk premium for Arizona Water to arrive at the authorized ROE, the Commission does <u>not</u> give Arizona Water a higher cost of equity than the sample water utilities; rather, the higher authorized ROE is required to give Arizona Water

the *same* opportunity - as required by the U. S. Supreme Court - to earn its cost of equity. With differences in rate-setting systems, the only way to give Arizona Water the same opportunity to earn whatever return is found by the Commission to be the Company's cost of equity is to increase the authorized ROE by an appropriate amount. If the rates being set for Arizona Water do not meet this expectation, but the rates being set for the water utilities sample do, the Company has not been given a reasonable opportunity to maintain the utility's financial integrity, does not earn a cost of equity commensurate with other enterprises having corresponding risks, and will not attract needed capital on reasonable terms.

- Q. AT PAGES 38-39 OF DECISION NO. 71845, THE COMMISSION STATED IT IS THE COMMISSION'S OBLIGATION TO CONSIDER THE INTERESTS OF RATEPAYERS WHEN BALANCING THE INTERESTS OF PARTIES. IS THIS OBLIGATION CONSISTENT WITH SETTING RATES DESIGNED TO GIVE ARIZONA WATER A REASONABLE OPPORTUNITY TO EARN ITS COST OF EQUITY?
- A. Yes. The cost of equity is a cost of service and thus it is reasonable for the Commission to set rates that allow a utility a fair opportunity to earn that required return. Rates should not be set to guarantee recovery of that cost, but should be set to allow the utility an opportunity of recovering this cost of service in the future. If the authorized ROE is set too high, the utility may earn more than that cost of equity. In like manner, if the authorized ROE is set too low, i.e., at a level which will produce a return below the cost of equity, that return does not meet the tests set forth by the U. S. Supreme Court. In such a situation, the result is not only unfair to investors but will ultimately harm ratepayers, since the utility would be unable to attract capital on reasonable terms to allow it to provide reliable public utility service. In such a situation, the cost of borrowing may increase (leading to

future increases in rates) and the utility may not be able to attract capital necessary to maintain an appropriate level of service to its customers. Considering the interests of ratepayers does not mean ignoring, or even discounting, the importance of allowing the utility the opportunity to earn its cost of equity. The ratepayers are entitled to assurance that the ROE is not set too high, but it is entirely consistent with the ratepayers' best interests that it not be set too low, in order to assure the health and viability of the utility enterprise.

Q. PLEASE SUMMARIZE YOUR CONCLUSIONS.

- A. My findings and recommendations are the following:
 - 1. Benchmark Cost of Equity. The market cost of equity faced by the water utilities sample (not adjusted for risks specific of Arizona Water) falls in a range of 10.9 percent to 12.3 percent, based on the following:
 - a. DCF model estimates for the water utilities sample indicate the benchmark cost of equity falls in a range of 11.6 percent to 12.4 percent with an average of 12.0 percent; and
 - b. Estimates of costs of equity derived with the CAPM indicate the benchmark cost of equity for the water utilities sample falls in the range of 10.2 percent to 12.2 percent with an average of 11.2 percent.

Checks of the CAPM estimates derived from risk premium models indicate the benchmark cost of equity for the water utilities sample falls in the range of 10.6 percent to 12.2 percent, with an average of 11.4 percent. Thus, these checks corroborate the average CAPM estimate.

2. Business Risk Adjustment. Because Arizona Water has greater business risks than the water utilities sample used to determine the benchmark cost of equity estimates, the Company requires a risk premium of at least 50 basis points, based on the following.

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- a. Three studies discussed in Section V indicate that comparatively smaller water utilities, such as Arizona Water, have a risk premium that falls in a range of 99 to 135 basis points;
- b. State-specific factors in Arizona increase Arizona Water's risk; these factors include a legal constraint on all Arizona water utilities that limits the ability to obtain rate increases outside general rate cases and a Commission requirement that utilities use an historic test period with limited opportunities to make out-of-period adjustments. A study of these state-specific risks of Arizona Water compared to relative risk of other water utilities indicates it requires a risk premium in the range of 32 to 61 basis points.
- 3. Combining the range of cost of equity estimates for the water utilities sample and a risk premium of 50 basis points, I conclude Arizona Water's required ROE falls in a range of 11.4 percent to 12.8 percent and recommend it be authorized an ROE of no less than 12.1 percent. See Table 20.
- Q. PLEASE PUT YOUR BENCHMARK COST OF EQUITY ESTIMATES IN PERSPECTIVE.
 - The recession and limited access to credit markets that have been ongoing for over two years continues. Value Line recently noted that industrial activity has taken a small step backward, and states "building activity is still weak, with data showing that housing starts flattened in September, while building permits fell," and the foreclosure crisis will only put more troubled properties on the market. Value Line, Selection & Opinion, October 29, 2010. While other sectors appear to be holding their own, Value Line has not ruled out a double-dip recession, noting that if housing and unemployment do not bottom out next year, we could be thrown into a second recession (the double dip). Value Line, Selection & Opinion, September 3, 2010. While there is no consensus about the likelihood of a double dip

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recession, investors continue to perceive considerable risk in the markets, and it is that perception of risk that impacts the cost of equity capital.

As a result of this uncertainty and risk, investors continue to price Treasury securities at relatively high levels (and thus bid down yields) compared to corporate bonds and stocks. Table 1 shows this "flight to quality" - in which investors shun corporate bonds and stocks in favor of the lower risk Treasuries - led to a spread between Baa bonds and Treasury rates during 2008 and 2009 that was almost double the average spread during 1990 to 2007. Table 2 shows that this high level of difference between Baa bond rates and Treasury security rates is expected to continue into the period 2011 to 2013, during which new rates for Arizona Water will be in effect. The predicted spread between rates for long-term Treasuries and Baa corporate bonds continues to be higher than the average spread during the period 1990 to 2007.

- III. Cost of Equity Estimates Based on the DCF Model
- Q. HOW SHOULD THE AUTHORIZED COST OF EQUITY FOR ARIZONA WATER BE DETERMINED?
 - To estimate the cost of equity, analysts require comparable market data that reveal investors' required returns; however, such data are not available for Arizona Water. There are no publicly-traded companies, let alone publicly-traded water utilities, that are perfectly comparable to Arizona Water. Costs of equity based on data from the publicly-traded water utilities sample, however, are most appropriate for use here since they are from utilities that provide the same services and thus provide a useful starting point in the determination of Arizona Water's costs of equity. In this section and in Section IV, I discuss costs of equity required in the first step of the three step process I laid out above.
- Q. PLEASE DISCUSS THE WATER UTILITIES SAMPLE YOU HAVE USED IN YOUR COST OF EQUITY ANALYSES.

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My water utilities sample includes American States Water, American Water Works, Agua America, California Water Service Group, Connecticut Water Service, Middlesex Water and SJW Corp. Six of these seven water utilities are the same publicly-traded water utilities that the ACC Staff relied on to determine benchmark equity costs in the W-01445A-08-0440 Rate Case and other recent rate cases (such as in Docket No. W-01303A-09-0343, dated March 8, 2010) for Class A and B water utilities. The seventh water utility making up the water utilities sample is American Water Works, which is the largest water utility in the United States. It was recently spun off by its parent and is now again a publicly-traded company. To the extent the data permit, I relied upon this full sample of seven water utilities to reach my benchmark equity cost estimates. Table 3 lists bond ratings, common equity ratios, percentages of regulated revenues from water utility operations, number of customers, operating revenues, net plant and market values for each of the utilities in the water utilities sample as reported by AUS Utility Reports in October 2010 and in 2009 SEC Form 10-K reports. The table also reports comparable values for Arizona Water, if they are available. Table 4 lists Value Line beta estimates that are available for the utilities in the water utilities sample. Beta estimates are estimates of market risk in the CAPM. Table 5 lists available historical growth data for utilities in the water utilities sample during the last fifteen years.

Q. DO YOU HAVE ANY CONCERNS WITH USING A SAMPLE OF THIS SIZE TO DETERMINE YOUR BENCHMARK COST OF EQUITY ESTIMATES?

A. Yes, I have some concerns with relying upon a sample of seven water utilities to reach cost of equity estimates but I recognize that this sample represents a fuller sample of water utilities than that used by ACC Staff in the past, since it also includes American Water Works. With a smaller sample size, it is important to exercise judgment and careful analysis with respect to the outcomes of any

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particular model and compare such results with information from a number of other models to evaluate the reasonableness of the results. When any method produces cost of equity results that seem extreme or unexpected, it is important to evaluate those results carefully and exercise judgment to ensure that the results are reasonable. To do so here, I present six alternative models.

Q. WHAT COSTS OF EQUITY ESTIMATES DO YOU PRESENT IN THIS SECTION OF YOUR TESTIMONY?

- A. In this section of my testimony, I estimate the Company's cost of equity using the constant growth DCF model with data for the water utilities sample as shown in Table 3. That calculation is detailed in Tables 7, 8, 9, 10, and 11. In Section V, I explain why a risk premium of no less than 50 basis points should be added to these benchmark equity cost estimates to account for Arizona Water's utilityspecific risks. After adding this risk premium to these equity cost estimates, I find the indicated DCF equity cost estimate for Arizona Water falls in a range of 12.8 percent to 12.9 percent when conceptually consistent forecasts of growth are used to prepare the analysis. If more conservative estimates of growth are adopted, the indicated cost of equity is 12.1 percent.
- Q. PLEASE EXPLAIN THE DCF METHOD OF ESTIMATING THE COST OF EQUITY.
- A. The constant growth DCF model computes the cost of equity as the sum of an expected dividend yield ("D₁/P₀") and expected dividend growth ("g"). The expected dividend yield is computed as the ratio of next period's expected dividend (" D_1 ") divided by the current stock price (" P_0 "). Generally, the constant growth model is computed with formula (1) or (2):
 - Cost of Equity $D_0/P_0 \times (1+q) + q$ (1)
 - Cost of Equity $D_1/P_0 + g$ (2)

Where D_0/P_0 is the current dividend yield and D_1/P_0 is found by increasing the current yield by the growth rate. The DCF model is derived from the valuation model shown in equation 3 below:

(3)
$$P_0 = D_1/(1+k) + D_2/(1+k)^2 + . + D_{\infty}/(1+k)^{\infty}$$

Where k is the cost of equity, P_0 is the current stock price, D_1 , D_2 , . D_∞ are the cash flows expected to be received in periods 1, 2, . . . ∞ , respectively. In the case of an expected acquisition or merger, P_0 may increase because investors expect a premium price (be it cash or the value of securities offered in a merger) that would have a present value larger than the present value of the growth in dividends and earnings. During the last ten years, investors received premiums when mergers and acquisitions of water utilities occurred.

Q. HOW DID YOU COMPUTE CURRENT DIVIDEND YIELDS?

A. My current dividend yield (D_o /P_o) estimates are based on the 6-month and 3-month average dividend yields for the utilities in the water utilities sample for periods ending in October 2010, and reflect the time value of money. They are presented in Table 7.

The time value of money should be taken into account when determining dividend yields. This adjustment is required because the basic model assumes dividends are paid once per year, but investors actually receive dividend payments on a quarterly basis. If, for example, a utility paid a dividend of \$100 per year, investors would prefer to receive dividend payments of \$25 per quarter rather than one payment of \$100 at the end of the year. The time value of money adjustment compensates for the fact that utilities pay dividends more frequently than once per year.

Q. TURN TO YOUR ESTIMATES OF GROWTH. DO YOU HAVE ANY CONCERNS
ABOUT USING PAST RECORDED DATA TO DETERMINE GROWTH
ESTIMATES FOR THE DCF MODEL?

A.

Yes. The DCF model requires the best available estimates of growth that investors expect in the future. Analysts' forecasts of future earnings per share ("EPS") growth provide those best available estimates. Comparisons of the data in Table 5, Table 8 and Table 9 show a negative bias in DCF estimates could occur if growth rates for DCF equity cost estimates are partially based on past growth in dividends per share ("DPS"), past growth in EPS and past growth from retained earnings and sales of shares of common stock above book value. In fact, investors now expect higher growth in the future than is indicated by historical data and my DCF model avoids placing too much emphasis on historical data. I have five observations in this regard:

First, an analysis performed by Gordon, Gordon and Gould found that a consensus of analysts' forecasts of EPS growth provided better forecasts of growth for the DCF model than did measures of growth based on past recorded data. They concluded it is logical for financial institutions and investment analysts to take such historical information into account together with more recent information when they determine their forecasts for the future. (David A. Gordon, Myron J. Gordon, and Lawrence I. Gould "Choice Among Methods of Estimating Share Yield," *Journal of Portfolio Management* (Spring 1989), pp. 50-55). They further concluded that to the extent past, recorded results provide useful indicators of future growth prospects, the forecasts should already incorporate the past and any further recognition of the past would be unnecessary and duplicative.

Second, evidence in Table 5, Table 8 and Table 9 shows investors expect more rapid growth in the future than in the past. Table 8 is a compilation of past growth rates reported by the California PUC Staff in various GRCs during the period 1992 to 1998 and the period 2000 to 2007. In the earlier period, analysts expected approximately the same growth in the future as had occurred in the past. During this earlier period and under conditions that existed at that time, past

growth was a reasonable proxy for growth investors expect in the future. But in the more recent period, Table 8 shows that analysts expect future growth rates to be higher than historic growth rates. Additionally, a comparison of data in Table 5 and Table 9 shows investors expect higher growth in the future than growth that occurred during the past fifteen years.

Third, analysts' forecasts of growth are readily available on the Internet and are easily accessed by knowledgeable investors when they form their opinions about anticipated future growth.

Fourth, it is reasonable to exclude measures of past DPS growth as an indicator of future sustainable growth for two reasons. One reason is that only one major financial institution provides forecasts of DPS growth using past DPS growth. If investors thought such DPS forecasts were valuable, more financial institutions would provide the forecasts. Another reason is that EPS are expected to grow more rapidly than DPS. Therefore, retained earnings are expected to increase, enabling DPS to grow faster in the future than in the past. As a result, past DPS growth is an extremely poor indicator of future long-term growth required in the DCF model.

Fifth, if investors believe future growth will be similar to past growth, then average growth in stock prices and book value per share ("BVPS") must also be considered. This is reasonable because investors know that, in equilibrium, common stock prices, BVPS, DPS and EPS will all grow at the same rate, and investors would take into account information about changes in stock prices and growth in BVPS when they price utilities' stocks. Table 5 shows that past growth in EPS, stock prices and BVPS have averaged 6.9 percent for the last fifteen years. If the Commission determines that some weight should be given to past growth

¹ The California PUC agreed in Decision 06-08-011 (California Water). In that case, the California Commission accepted California Water's testimony and removed historical DPS growth from the overall average growth rate calculation.

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when determining DCF estimates, it should rely on averages of past growth in EPS, BVPS and stock prices reported in Table 5.

Q. HOW DID YOU ESTIMATE GROWTH RATES?

A. My primary DCF analysis relies on analysts' consensus estimates of growth reported by four reliable and accepted institutions - Zacks, Yahoo! Finance, Reuters, and Value Line. Reports published by Value Line are generally available in public libraries. The other three sources provide forward-looking estimates of growth that are readily available to investors on the Internet.

Q. WHERE DO YOU REPORT THE ANALYSTS' FORECASTS?

Table 9 reports the analysts' forecasts of future growth. The first three columns of Table 9 show analysts' consensus forecasts of future EPS growth rates reported by *Zacks*, *Yahoo! Finance*, and *Reuters* on the Internet on November 3, 2010 for the utilities in the water utilities sample. The fourth column shows comparable *Value Line* estimates of growth for the four larger water utilities on October 22, 2010. Value Line does not make such forecasts for companies in the Small and Mid-Cap Edition, but instead reports analysts' forecasts of future EPS growth if they are available. No analysts' forecasts were reported in the October 22, 2010 Value Line reports for the three utilities in the Small and Mid-Cap Edition for Connecticut Water Service, Middlesex Water and SJW Corp.

Q. HOW DID YOU ESTIMATE GROWTH FOR THE SAMPLE?

A. I estimated growth by determining a weighted average of the available forecasts of 8.4 percent, which I adopt for my analysis. In making this weighted average estimate, I give equal weight to each of the forecasts reported in Table 9. This weighting method gives more weight to forecasts for the utilities followed by more analysts. A.

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Q. HOW DID YOU UTILIZE THE INFORMATION ON DIVIDEND YIELDS AND ESTIMATED FUTURE GROWTH TO MAKE YOUR INITIAL DCF ESTIMATES FOR THE WATER UTILITIES SAMPLE?

I combined my estimate of average future growth of 8.4 percent shown in Table 9 with the range in dividend yields from Table 7 with the constant growth DCF model specified in equation (1) to compute the DCF cost of equity range for the water utilities sample. Table 10 shows that the application of this specification of the DCF model indicates a cost of equity range of 12.3 percent to 12.4 percent for the water utilities sample. This range of costs of equity for the water utilities sample does not, however, account for the additional risk faced by Arizona Water. In Section V below, I explain why a risk premium of no less than 50 basis points is required by Arizona Water. Combining that risk premium with this primary DCF estimate of the cost of equity range for the water utilities sample indicates the cost of equity for Arizona Water falls in a range of 12.8 percent to 12.9 percent.

Q. PLEASE EXPLAIN YOUR SECOND DCF ESTIMATE.

A. My second DCF estimate is based on the concepts used by ACC Staff to determine DCF costs of equity in past cases. Those concepts assume that investors consider both past growth and projections of growth in making DCF cost of equity estimates. While the Staff approach does not take into account the logic and quantitative analysis reported by Gordon et. al. discussed above, the Commission has relied on it in the past and thus I include it as a second DCF approach.

In implementing this approach, I used the estimates of projected growth in Table 9 and the average of the estimates of past growth during the last fifteen years provided in Table 5 to determine my estimates of average past growth. With respect to projected growth rates, the estimates I rely upon are based on averages reported by the four financial institutions identified above. With respect to past growth, in equilibrium, we expect EPS, DPS, BVPS and common stock prices to grow at the same rate, but recognize that past DPS growth is a poor indicator of the future equilibrium growth that investors can reasonably expect.

Q. WHERE DO YOU REPORT THE RESULT OF YOUR SECOND DCF ANALYSIS?

A. It is reported in Table 11. This additional analysis indicates the benchmark cost of equity for the water utilities sample is 11.6 percent which, when combined with a 50 basis point risk premium, indicates a cost of equity for Arizona Water of 12.1 percent. I used the dividend yields from Table 7, which I used in my first DCF analysis, and average growth rates determined in Table 5 (6.9 percent) and in Table 9 (8.4 percent), to get the average growth rate of 7.7 percent shown in Table 11.

IV. Cost of Equity Estimates Based on the CAPM and Risk Premium Analyses

Q. WHAT IS THE CAPITAL ASSET PRICING MODEL?

- A. The basic or traditional CAPM is a model that was developed by William Sharpe and John Lintner in the mid-1960s. It was tested with data for common stocks in the early 1970s and is now a common topic in college finance textbooks. CAPM is a specific application of the risk premium approach. The traditional version of CAPM provides that the cost of equity is explained by the following relationship:
 - (4) Cost of Equity = RF + β x MRP, where RF is the return on a risk-free asset (an asset with a "zero" beta), the beta (" β ") is the relative risk of the security at issue and the market risk premium ("MRP") is the additional return that is required by investors to hold an average risk asset instead of the risk-free asset. In this RP model, the risk premium for an enterprise is determined by multiplying the beta for the enterprise times the MRP. Beta measures the sensitivity of a stock price to changes in market returns. Market values of low beta, or less risky, stocks are expected to decline less than

 the market values of stocks with betas of 1.0 (average risk stocks) when the market falls.

Morningstar (formerly Ibbotson Associates) explains that the appropriate choice for RF is a return that is no less than the expected return for long-term Treasury securities:

The horizon of the chosen Treasury security should match the horizon of whatever is being valued. When valuing a business that is being treated as a going concern, the appropriate Treasury security should be that of a long-term Treasury bond. Note that the horizon is a function of the investment, not the investor. If the investor plans to hold a stock in a company for only five years, the yield on a five-year Treasury note would not be appropriate since the company will continue to exist beyond those five years...

Companies are entities that generally have no defined life span; when determining a company's value, it is important to use a long-term discount rate because the life of the company is assumed to be infinite. Morningstar, *Ibbotson SBBI 2010 Valuation Yearbook*, pages 44, 55.

For consistency, the MRP is also computed as the expected difference between returns for the market and the long-term Treasury security. Other versions of the CAPM include not only beta risk but also variables designed to reflect risks related to size of companies and other factors. Additionally, some alternative versions of the CAPM reflect empirical evidence that a correct value for RF is expected to be in excess of the yield on long-term Treasury securities. (See Morin, *New Regulatory Finance*, 2006, pages 189-191)

- Q. PLEASE TURN TO YOUR RISK PREMIUM ("RP") COST OF EQUITY ESTIMATES. HOW MANY RP ANALYSES HAVE YOU MADE IN THIS CASE?
- A. I have made two RP analyses based on the CAPM and used two additional RP methods to provide checks on the CAPM estimates. The CAPM is a specific version of the more general risk premium approach. My CAPM estimates are based on the traditional CAPM and two alternative estimates of the MRP. With the

extreme volatility in equity markets at this time, it is difficult to determine what MRP is expected and required by investors. Given this uncertainty with the results of the CAPM, I rely on a range of MRP estimates and two other RP analyses to provide checks on the reasonableness of estimates made with the results derived from the CAPM analyses.

Q. WHERE DO YOU PROVIDE YOUR CAPM ANALYSES?

A. They are provided in Tables 12 and 13. ACC Staff relied on two CAPM estimates in recent testimony. See Staff testimony in Docket No. W-01303A-09-0343, dated March 8, 2010. Staff's methods are based on a current market risk premium and a long-horizon average market risk premium but use different measures of the risk-free rate. My CAPM estimates also rely on the long-horizon average MRP and an estimate of the current MRP, but are based on the same, conceptually more appropriate measure of RF.²

Q. PLEASE DISCUSS THE CAPM ESTIMATE IN TABLE 12.

A. The CAPM estimate is based on an RF (risk-free asset return) of 5.03 percent from Table 2, an average beta of 0.76, taken from Table 4, and an estimate of the long-horizon average market risk premium of 6.7 percent. The 6.7 percent MRP is the long-horizon MRP reported by Morningstar in Table 5-1 of Morningstar, *Ibbotson SBBI 2010 Valuation Yearbook.* Based on this data, the CAPM estimate indicates a cost of equity of 10.2 percent for the water utilities sample and a cost of equity of 10.7 percent for Arizona Water. See Table 12.

Q. DO YOU HAVE ANY CONCERNS WITH THIS CAPM ESTIMATE?

A. Yes. I have two concerns. First, based on the empirical results presented by Morningstar in Ibbotson SBBI 2010 Valuation Yearbook, I expect the beta estimate for Arizona Water would be greater than .0.76, if it were known. The Morningstar

² Morin reports a number of empirical studies that found the value for RF should be higher than the long-term Treasury rate. Morin, New Regulatory Finance, 2006, pages 190. Utilities typically have betas less than 1.0. With a beta less than 1.0, the empirical results reported by Morin means the CAPM will produce negatively biased estimates of the cost of equity even if the long-term Treasury rate is adopted in the analysis.

evidence shows beta estimates are expected to increase as companies become smaller. Arizona Water is smaller than all of the water utilities in the water utilities sample and, as a result, I expect the CAPM estimate in Table 12 is biased downward due to it being based on the average beta for the water utilities sample.

My second concern is that there is substantial evidence in the market indicating investors now require a MRP that is higher than the long-horizon average estimate of 6.7 percent. Value Line recently stated "investors are on edge" and that there is currently an elevated level of volatility in financial markets. Even though Value Line is not predicting a double-dip recession (in which we have another recession before we fully recover from the last one), "the margin for error is lessening," and it opines that any delays in the turn-around in housing and unemployment could indeed throw us back into recession. (Value Line, Selection & Opinion, September 3, 2010) The important thing to note is not whether one agrees or disagrees with whether the economy is heading for a double dip recession but that such market indicators are evidence that many investors are worried about that potential, which increases volatility and risk.

In addition to the DCF cost of equity estimates presented in Section III, evidence from at least the following two sources indicates the required MRP is higher than 6.7 percent:

First, the method ACC Staff uses to determine a current market risk premium indicates the MRP above my forecast of the long-term Treasury rate is 9.5 percent at this time. As of October 29, 2010, Value Line forecasts the appreciation potential for 1700 stocks it follows in its Standard Edition is 60 percent during the next 3 to 5 years, an annual rate of appreciation of 12.5 percent. Once I combine the expected dividend yield (2.1 percent over the next 12 months) with the annual share growth rate (12.5 percent) that Value Line projects for all dividend paying stocks, the indicated expected market return is 14.6 percent. With an

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expected long-term Treasury rate of 5.1 percent (from Table 2), the indicated MRP for the next several years is 9.5 percent. See Table 14.

A second source indicating investors currently require a MRP in excess of the long-term average of 6.7 percent is an average of Value Line's forecasts for its Industrial Composite ("IC"). At the present time, the IC consists of 886 industrial, retail and transportation companies which comprise 78 of Value Line's 98 industry groups. Financial data and stock market values for these companies have been pooled as if they belong to one large corporation. Given the breadth of the industry groups considered in the IC analyses, the risk premium for this group of companies will be similar to the MRP for the market as a whole. I performed 38 DCF analyses using data reported by Value Line for the IC during the period 1984 to 2010. See Table 15. To compute growth rates, I averaged Value Line's forecasts of EPS growth and future growth from retained earnings for each of those Value Line studies. Over the entire period, the average indicated risk premium was 6.5 percent—an average close to the long-horizon average MRP of 6.7 percent used to perform the CAPM analysis in Table 12. During the last five years, however, the indicated average of expected risk premiums is 9.4 percent. These estimates of 9.5 percent and 9.4 percent indicate investors require a MRP in excess of 6.7 percent.

Q. WHAT VALUE FOR THE MRP DID YOU ADOPT FOR YOUR SECOND CAPM ANALYSIS?

I adopted the five-year average risk premium for the IC of 9.4 percent for the second estimate of the MRP. This value is less than the 9.5 percent MRP indicated with my application of a method similar to the one ACC Staff typically uses to estimate a current MRP and thus is a more conservative estimate of the current MRP. When this estimate of the MRP is combined with the beta of 0.76 (from Table 4) and RF of 5.03 percent (from Table 2), the indicated CAPM cost of

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equity for the water utilities sample is 12.2 percent and the indicated cost of equity for Arizona Water is 12.7 percent. See Table 13.

Q. ARE YOU SURPRISED THAT THE CAPM PRODUCES SUCH A WIDE RANGE OF COST OF EQUITY ESTIMATES?

- A. No. The 200 basis point range of costs of equity for the water utilities sample can be explained, in part, by the continued volatility in the stock market. It is very difficult to judge what investors currently require for a MRP. This uncertainty about the MRP creates a major concern with application of the traditional CAPM. As a result, I adopt an average of my two CAPM estimates of 11.2 percent as my CAPM estimate, and conduct two checks on the reasonableness of the 11.2 percent ROE estimate with other risk premium approaches.
- Q. ARE OTHER RISK PREMIUM APPROACHES WIDELY USED BY FINACNIAL ANALYSTS IN REGULATORY PROCEEDINGS?
 - Yes. Dr. Roger Morin devotes Chapter 4 of his 2006 book, *New Regulatory Finance*, to a discussion of various risk premium approaches. Morin observes that risk premium methods have been presented in regulatory proceedings for many years. (Page 107) He also states that "Risk premium analyses are widely used by analysts, investors, and expert witnesses and are widespread in investment community reports." (Page 108) Morin further explains that the risk premium approach to estimating the cost of equity derives its usefulness from the simple fact that while equity return requirements cannot be readily quantified at any given time, the returns on bonds can. Thus, if the risk premium is known, it can be used to produce a useful estimate of the cost of equity. (Page 108)

I present two additional RP approaches below. Just as with the CAPM, these RP approaches recognize bonds are less risky than stocks but determine risk premiums in some way other than by multiplying a beta times an estimate of the MRP. Given the difficulty with the determination of the MRP currently expected

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by investors, these approaches provide alternative cost of equity estimates that confirm that an 11.2 percent cost of equity estimate (made with CAPM) is reasonable at this time.

Q. WHERE DO YOU REPORT YOUR OTHER RISK PREMIUM ANALYSES?

A. They are reported in Tables 16 and 17. In Table 16, I present a version of the risk premium method adopted by the California PUC Staff, in which I adopt authorized ROEs as proxies for costs of equity. Table 17 presents the second risk premium approach, in which average annual estimates of the cost of equity for water utilities are based on annual cost of equity estimates determined with the DCF model.

Q. PLEASE EXPLAIN THE ANALYSIS IN TABLE 16.

This first analysis is a modified version of the method used by California PUC Staff in a number of cases. The proxies for the average annual costs of equity in this analysis are averages of available estimates of authorized ROEs for the seven utilities in the water utilities sample as reported by CA Turner/AUS Utility Reports at the beginning of the year being reported. This choice was made to match the authorized ROEs and the long-term Treasury rates in the year being considered. CA Turner/AUS Utility Reports does not provide information about the ROE that was authorized for American Water Works in those years when it was not publicly traded. However, data for all of the other utilities in the water utilities sample were available to compute the average. In those other years, the average ROE was based on an average of available data for six of the seven water utilities.

Q. WHERE DO YOU REPORT YOUR ESTIMATES OF FORECASTED INTEREST RATES?

A. They are reported in Table 2. Averages of forecasts of long-term Treasury rates for the period 2011 to 2013 were used in my RP analyses. The cost of equity estimates made with the risk premium analyses should be for the period new rates will be in effect, not the cost of equity today, and thus forecasted interest rates

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should be used in the CAPM and the various RP analyses. In my opinion, a forward-looking period of three years is a reasonable future period to use in this analysis. It also reflects a time period during which Arizona Water's new rates will be in effect.

Q. WHAT IS THE RESULT OF THE FIRST RP ANALYSIS?

A. Given the current forecast of long-term Treasury rates of 5.07 percent, the cost of equity range indicated with this risk premium approach is 10.6 percent to 10.8 percent for the sample and 11.1 percent to 11.3 percent for Arizona Water.

Q. PLEASE DISCUSS YOUR SECOND RP ANALYSIS.

The second RP analysis adopts ten annual average DCF estimates as the proxies for the cost of equity in ten different years. I subtract the long-term average Treasury rate for the respective years to determine ten annual estimates of the average risk premiums required by water utilities in those years. I then compute five-year and ten-year averages of those risk premiums to determine the forwardlooking risk premiums for the analysis.

These annual DCF estimates are averages of annual DCF estimates derived from available data for the water utilities sample.³ See Table 17. Current dividend yields for each utility were computed as an annual average of yields for the various years. Growth rates are averages of EPS growth rates forecast by Value Line and analysts' forecasts reported in the S&P Earnings Guide until 2008. when S&P stopped publishing the Earnings Guide. If the S&P Earnings Guide was not available, forecasts reported by Zacks were used. The annual costs of equity for each utility were averaged to compute annual average costs of equity for each of the ten years in the study. This RP analysis indicates a cost of equity range of 11.0 percent to 12.2 percent for the sample and a cost of equity range for Arizona Water of 11.5 percent to 12.7 percent.

Data for American Water Works were only available in 2000, 2001, 2002 and 2009.

- Q. PLEASE SUMMARIZE THE CHECKS ON YOUR CAPM ESTIMATE OF 11.2 PERCENT.
- A. I conducted two checks of the CAPM estimate with these two alternative risk premium approaches. The CAPM is a special case of the more general risk premium approach. Based on the two other RP approaches, the cost of equity for the water utilities sample falls in a range of 10.6 percent to 12.2 percent. The 11.2 percent ROE I estimate with the CAPM approach is close to the middle of that range and thus is corroborated by these estimates.
- V. Additional Risks of Arizona Water
- Q. WHY IS IT NECESSARY TO CONSIDER RISKS SPECIFIC TO ARIZONA
 WATER IN ADDITION TO DETERMINING THE BENCHMARK COST OF
 EQUITY FOR THE WATER UTILITIES SAMPLE?
- A. The purpose of my analysis is to determine the cost of equity for Arizona Water, not just the benchmark cost of equity for the water utilities sample. Determining the benchmark cost of equity for the water utilities sample takes into account risks common to all water utilities, but not risks that are specific to the target utility whose equity cost we are trying to determine. To complete the cost of equity analysis, we must consider Arizona Water's company-specific risk in addition to determining the benchmark cost of equity for the water utilities sample.
- Q. HOW DO YOU APPROACH EVALUATING ARIZONA WATER'S SPECIFIC RISKS?
- A. It is useful to categorize risks into business risk and financial risk. Financial risk is risk that is related to the financial leverage of the utility. Business risks are those risks that are unique for the particular utility because of its structure and operating environment, and are independent of any financial risks.

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PLEASE ADDRESS DIFFERENCES IN FINANCIAL RISK OF ARIZONA WATER Q. AND THE WATER UTILITIES SAMPLE. DO SMALLER UTILITIES REQUIRE HIGHER EQUITY RATIOS THAN LARGER UTILITIES?

- Yes. In a now classic article, Scott and Martin, "Industry Influence on Financial Structure," Financial Management, Spring 1975, pp. 67-71, found statistically significant results for unregulated firms that show " . . .[s]maller equity ratios (higher leverage use) are generally associated with larger companies" (page 70). It is reasonable to presume these unregulated firms attempted to have low cost capital structures. In conducting their study, Scott and Martin analyzed twelve industries and found a "... linear relation between equity ratios and total assets within each industry". That study indicates smaller firms attempting to establish low cost capital structures will have higher equity ratios than larger firms in the same industry. Arizona Water is smaller than all of the utilities in the water utilities sample and thus would be expected to maintain an equity ratio that is larger than the equity ratios of those larger utilities.
- IS THERE A RELATIONSHIP BETWEEN SIZE AND APPROPRIATE EQUITY Q. **RATIOS?**
- Yes, the evidence in the Scott and Martin article indicate that, generally, larger water utilities are expected to have lower equity ratios. Data in Table 3 are consistent with this expected relationship. The equity ratios for the two largest utilities in the water utilities sample, American Water Works and Aqua America, are less than 45 percent but the average equity ratio for the remaining five water utilities is 52 percent.
- WHAT DO THE SCOTT AND MARTIN ARTICLE AND THE EVIDENCE IN Q. TABLE 3 INDICATE ABOUT THE APPROPRIATE EQUITY RATIO FOR **ARIZONA WATER?**

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Arizona Water is smaller than all of the utilities in the water utilities sample. Thus, this evidence indicates it would be appropriate for Arizona Water to have an equity ratio of at least 52 percent and shows that Arizona Water's equity ratio of 51 percent is reasonable.

HAVE YOU INCLUDED A RISK PREMIUM FOR ARIZONA WATER BASED ON Q. LEVERAGE?

A. No, I have not, although an argument could be made for a higher risk premium based on this factor. As a result, taking a conservative approach, the risk premium I estimate for Arizona Water considers business risk only.

Smaller Water Utilities Have More Business Risk

- PLEASE TURN TO YOUR CONSIDERATION OF DIFFERENCES BETWEEN Q. BUSINESS RISKS OF ARIZONA WATER AND THE WATER UTILITIES SAMPLE. DOES ARIZONA WATER HAVE MORE BUSINESS RISK THAN THE WATER UTILITIES SAMPLE BECAUSE OF ITS SIZE?
- Α. Yes. Arizona Water is more risky because it is smaller than every utility in the water utilities sample. Table 3 compares customer counts, operating revenues and net plant of Arizona Water with comparable values for the water utilities sample. Based on these measures of size, Arizona Water is very much smaller (between 89 percent and 92 percent smaller) than the average utility in the water utilities sample, and is smaller than all of the seven utilities in the sample. These measures of size indicate Arizona Water is more risky and requires a higher ROE than the equity costs estimated for the water utilities sample.

Q. DO QUANTITATIVE STUDIES SHOW THAT SIZE HAS AN IMPACT ON RISK?

Α. Yes. Quantitative studies show that smaller companies in general, and smaller water utilities in particular, have higher costs of equity. The original CAPM. developed in the mid-1960s, relied upon beta as the only measure of risk. Eugene Fama and Kenneth French conducted empirical studies that showed beta risk

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tends to be higher for small companies, but even after recognizing differences in beta risk, smaller companies are generally more risky than larger ones.⁴ In effect, Fama and French found company size and distress must be considered in addition to beta risk in order to achieve a complete determination of risk and the required return on equity.

Q. HAVE OTHER EXPERTS ON THIS TOPIC STUDIED THIS ISSUE?

Yes. Morningstar (formerly lbbotson Associates) studied the issue of firm size and risk over a number of years and found that beta risk is typically higher for smaller companies than for larger companies. Also, independent of differences in beta risk, Morningstar found that smaller companies require higher returns than would be predicted by the original version of the CAPM.⁵ Data from the Morningstar. 2010 Ibbotson SBBI Valuation Yearbook are reported in Table 6. Footnotes in Table 6 show the threshold sizes of companies in the Micro-Cap, Low-Cap and Mid-Cap categories in the study reported by Morningstar in *Ibbotson SBBI 2010* Valuation Yearbook. Table 3 reports market valuations of the water utilities sample comparable to the market capitalization values reported in the footnotes in Table 6. Three of the utilities in the water utilities sample are in the Micro-Cap category, two are in the Low-Cap category and two are in the Mid-Cap category. Table 6 shows that, based on the Ibbotson 2010 study, even without accounting for differences in beta risk, companies the size of the three smallest utilities in the water utilities sample require expected returns that are 136 basis points higher than companies in the Low-Cap category and an even higher risk premium than Agua America and American Water Works, which are in the Mid-Cap category. The Morningstar/lbbotson studies also found that there is no "bright line" between large and small enterprises but that enterprises require increasingly higher returns as

⁴ "Industry Costs of Equity," Journal of Financial Economics 43 (1997), pp. 153-193, and "The Capital Asset Pricing Model: Theory and Evidence," *Journal of Economic Perspectives*, Vol. 18, No. 3, Summer 2004, pp. 25-46.

⁵ See Table 7-11 in Morningstar, *Ibbotson SBBI 2009 Valuation Yearbook*.

Arizona Water is much smaller than the three smallest utilities in the water utilities sample. All other factors being equal, this study indicates a company the size of Arizona Water requires a risk premium of no less than 136 basis points.

size decreases. Based on customer counts, operating revenues and net plant.

- Q. PLEASE TURN TO SPECIFIC STUDIES FOR WATER UTILITIES. HAS THE CALIFORNIA PUC ANALYZED DIFFERENCES IN RISK BETWEEN SMALLER AND LARGER WATER UTILITIES?
- A. Yes, Staff of the California PUC analyzed differences in risk between larger and smaller water utilities. The CPUC Staff estimated proxies for beta risk with accounting data for 58 small water utilities that were not publicly traded, and found that smaller water utilities (Class C and Class D) required equity returns higher than the larger Class A water utilities, even though most of those smaller water utilities were financed with 100 percent equity. The study found that business risk increased as the size of water utilities decreased. This increase in business risk more than offsets the lower financial risk that accompanies higher equity ratios. The California PUC makes annual determinations of costs of equity for the smaller water utilities most recently in March 2010 and the California PUC continually finds smaller water utilities (Class B, Class C and Class D) require higher returns on equity than larger Class A water utilities.
- Q. HAVE YOU PUBLISHED ANY STUDIES ON HOW THE SIZE OF UTILITIES AFFECTS RISK?
- A. Yes. Exhibit TMZ-3 is my article, "Utility Stocks and the Size Effect Revisited,"
 The Quarterly Review of Economics and Finance, Vol. 43, Issue 3, Autumn 2003,
 pp. 578-582, which addresses this issue. The results of my study are included in
 Panel 2 of Table 6.

⁶ California PUC Staff, Staff Report on Issues Related to Small Water Utilities, June 10, 1991 and CPUC Decision 92-03-093.

Market information is required to estimate costs of equity. It is difficult to find useful market information for small water utilities because many of the small utilities, such as Arizona Water, are not publicly traded. Market data required to make DCF cost of equity estimates for four water utilities in California, however, were available to conduct such an analysis for the period 1987 to 1997. My study determined DCF costs of equity for those enterprises with methods used by the California PUC Staff and then compared average costs of equity of the two smaller water utilities, Dominguez Water Company and SJW Corporation (San Jose Water), with costs of equity for the two larger companies, California Water Service and American States Water. The table at page 4 of Exhibit TMZ-3 reports that the smaller water utilities had a cost of equity that, on average, was 99 basis points higher than the average cost of equity for the larger water utilities. The t-statistic reported in that table shows that the cost of equity for the smaller water utilities is statistically significantly higher than the cost of equity for the larger water utilities.

This market information provides another indication of the risk premium required by Arizona Water. Table 3 shows Arizona Water is smaller than all of the utilities in the water utilities sample and thus Arizona Water has a higher cost of equity. An appropriate risk premium for Arizona Water will incorporate a risk premium commensurate with its smaller size.

- Q. ARE YOU AWARE OF A REGULATORY COMMISSION THAT RECENTLY FOUND IT REASONABLE TO PROVIDE A RISK PREMIUM ADJUSTMENT FOR SIZE?
- A. Yes. In Golden Heart/College Utilities Order U-07-76(8)/U-07-77(8), dated June 30, 2008, at page 70, the Regulatory Commission of Alaska found that differences between the risks of the larger water utilities used to determine benchmark costs of equity and the risks of the smaller Alaska water utilities at issue in that case justified a size premium of 100 basis points. Alaska Power Company is another

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 small utility. In the September 29, 2010 order for Alaska Power Company, Docket U-09-90, Order No. 8, at page 13, the Regulatory Commission of Alaska stated "Considering all of the testimony on the cost of equity for the proxy groups and the special risk factors faced by APC, we find that a return on equity of 12.8 percent most reasonably represents APC's cost of equity." The small size of APC was one of the special risk factors.

Application of California PUC DRA Staff's Risk Analyses

Q. IS THERE OTHER EVIDENCE THAT SHOWS ARIZONA WATER REQUIRES A RISK PREMIUM?

Yes. Dr. J. Randall Woolridge filed testimony on behalf of the Division of Ratepayer Advocates ("DRA") of the California PUC in Application 09-05-001. (Exhibit DRA-1, dated July 10, 2009.) As part of that testimony, DRA presented a study designed to estimate company-specific risk premiums for five Class A water utilities that were parties to a generic ROE proceeding conducted in 2009. When the California DRA Staff analysis is applied to data for Arizona Water, the indicated required risk premium for Arizona Water falls in a range of 32 to 61 basis points. A Class A water utility in California is defined to be one having over 10,000 service connections.

Q. PLEASE EXPLAIN THE CALIFORNIA DRA STAFF ANALYSIS.

The California DRA analysis was based on two tests which were used to assess the relative risk of five California Class A water utilities. Those risk assessments were discussed at pages 56-58 of Exhibit DRA-1 and the results of the analyses were presented in Attachment JRW-13 in that case. (Attached hereto as Exhibit TMZ-4.) DRA's two tests provide quantitative estimates of relative risk and are applicable to water utilities which are both publicly-traded and those that are not. Thus, these tests can be used to provide estimates of the relative risk of Arizona Water and provide another indicator of the risk premium required by the Company.

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WHAT IS THE FIRST TEST USED BY THE DRA IN ITS ASSESSMENT OF RISK IN THAT CASE?

- The first test compares earned versus authorized ROEs for five year periods for utilities in two samples. One sample is composed of the five California Class A water utilities which were parties in Application 09-05-001. The other sample is the water utilities sample used to determine benchmark cost of equity estimates in this case for which there are data available to make the tests. In this first test, underearning an authorized ROE is an indication of higher risk.
- Q. WHAT IS THE SECOND TEST USED BY THE DRA IN ITS ASSESSMENT OF RISK IN THAT CASE?
- A. The second test compares Coefficients of Variation ("CV") of earned ROEs during five year periods. The CV, computed as the standard deviation of earned ROEs divided by the mean ROE, is a standardized measure of volatility and thus is a measure of relative risk. In this test, a higher CV indicates higher risk.
- Q. PLEASE DISCUSS THE RESULTS OF YOUR FIRST TEST OF THE RELATIVE RISK OF ARIZONA WATER COMPARED TO THE TWO SAMPLES OF WATER UTILITIES.
- A. For both tests, I used five years of data, as did the DRA Staff. The data for the California water utilities were limited to available data for 2004-2008, which were provided to DRA in response to data requests. Data for 2009 were not available. Data for the water utilities sample and Arizona Water are based on the most recent five-year period of 2005-2009. The updated 2009 data were obtained from AUS Utility Reports, 10-K Reports to the SEC and from Arizona Water.

For the first test, when I compared earned versus authorized ROEs, the results for the California sample were significantly affected by very high earned ROEs for Suburban Water. Thus, to avoid overstating the relative risk of Arizona Water, I did not include Suburban Water in the averages reported in the analysis.

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During the five year period of the California study conducted by DRA Staff, on average, the remaining four California Class A water utilities under-earned their authorized ROEs, with an average level of underperformance of -0.45 percent. By comparison, the average underperformance for Arizona Water was -3.04 percent during the last five years. Based on this measure of relative risk, an investment in Arizona Water is 6.8 times more risky than an investment in the four California water utilities. See Table 18.

Consideration of the water utilities sample during the most recent five-year period showed that an investment in Arizona Water is also more risky than the sample used to determine benchmark cost of equity estimates. On average, the water utilities sample underperformed by -0.92 percent. The range of over (under) performance ranks for companies in this sample ranged from an underperformance -2.34 percent for Connecticut Water Service to an over-performance of +0.96 percent for SJW Corp. Thus, based on this first test, Arizona Water was at least 3.3 times more risky than the average utility in the water utilities sample. See Table 19.

Q. PLEASE TURN TO THE RESULTS FOR THE SECOND RELATIVE RISK TEST.

In the second relative risk test, the average CV for the California Class A water utilities was 0.20, and the average CV for the utilities in the water utilities sample was 0.22. By comparison, the average CV for Arizona Water was 0.38. This CV test also indicates the relative risk of investing in Arizona Water is greater than the relative risks of investing in any of the utilities in the sample of California Class A water utilities, and is much greater than the average risk for either sample. Based on the CV test, Arizona Water is 70 percent more risky than the average utility in the water utilities sample, at least 90 percent more risky than the average utility in the sample of California Class A water utilities, and 30 percent more risky than the

highest risk water utility (Valencia Water) in the California Class A water utilities sample.

Q. CAN THESE ANALYSES BE USED TO PROVIDE ANOTHER ESTIMATE OF THE RISK PREMIUM REQUIRED BY ARIZONA WATER?

A. Yes, according to California DRA Staff, the results of these analyses support a risk premium of 25 basis points for Valencia Water, the most risky Class A water utility in the California generic ROE case. Valencia Water had an under-performance of -1.25 percent and CV of 0.30, which indicated it was more risky than the other California Class A water utilities. (See testimony filed in Exhibit DRA-1, California Application 09-05-001, page 57 and Attachment JRW-13, page 5, attached to this testimony as Exhibit TMZ-4). DRA Staff concluded that based on these relative risk analyses, Valencia Water should be authorized a risk premium of 25 basis points.

Q. BASED ON THESE MEASURES OF RELATIVE RISK, DOES ARIZONA WATER REQUIRE A RISK PREMIUM LARGER THAN 25 BASIS POINTS?

A. Yes. Relying on these same tests, Arizona Water is a more risky investment. When compared to the 25 basis point risk premium recommended for Valencia Water, these analyses indicate Arizona Water should be authorized a risk premium in the range of 32 basis points (25 basis points times the ratio of the CV for Arizona Water of .38 divided by a CV of .30 for Valencia Water) and 61 basis points (25 basis points times a ratio of the underperformance of Arizona Water of -3.04 percent divided by the underperformance of Valencia Water of -1.25 percent).

Recommended Risk Premium

Q. WHAT IS YOUR RECOMMENDED RISK PREMIUM FOR ARIZONA WATER?

A. I recommend a risk premium of 50 basis points. This recommended risk premium takes into account the fact that Arizona Water is smaller than all of the utilities in the water utilities sample. It is a conservative estimate of the required risk

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premium given risk premium estimates in the range of 99 to 136 basis points indicated by the results of the Morningstar study, the study of water utility risk premiums conducted by the California PUC and my study for water utilities (Exhibit TMZ-3). It is also supported by the fact that Arizona Water has a reduced opportunity to earn its cost of equity because its future rates are determined using historic test years with limited out-of-period adjustments compared to other water utilities with rates and rate-adjustment mechanisms that give them better opportunities to recover their costs of equity. The 50 basis point risk premium I recommend is corroborated by application of the relative risk analysis conducted by Staff of the DRA in California to data for Arizona Water, which indicates the appropriate risk premium for the Company falls in a range of 32 to 61 basis points.

VI. Summary and Conclusions

Q. PLEASE SUMMARIZE YOUR RECOMMENDATION.

I recommend the Commission adopt the three-step method I presented above to determine the ROE for Arizona Water. In the first step, an average of costs of equity for the seven utilities in the water utilities sample is determined with the DCF model and the CAPM with checks made with two other RP models. I have concerns with the CAPM estimates at this time of market volatility, but adopt the ACC Staff method of estimating the cost of equity by giving both the CAPM and the DCF estimates the same weight.

In the second step, a risk premium for Arizona Water is determined to reflect the Company's higher business risks. Based on considerations of size, limitations placed on test year expenses and rate base used to determine revenue requirements and a relative risk analysis, I recommend a company-specific risk premium of 50 basis points be adopted for the Company.

In the third step, costs of equity from step one and the risk premiums from step two are combined to determine a fair ROE range for Arizona Water of 11.4

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	5
	6
	7
	8
	9
1	0
1	1
1	2
1	3
1	4
1	5
	6
1	7
1	8
1	9
2	0
2	1
2	2
2	3
	4
2	5
2	6
2	7

percent to 12.8 percent. I recommend the Commission adopt an ROE for Arizona Water of 12.1 percent, the average of that cost of equity range.

- Q. GIVEN THE RESULTS OF YOUR COST OF EQUITY ANALYSES, IS AN ROE
 OF 12.1 PERCENT FOR ARIZONA WATER FAIR AND REASONABLE, BOTH
 TO THE UTILITY AND ITS RATEPAYERS?
- A. Yes. A 12.1 percent ROE is the average of the top and bottom of the range and thus is a reasonable ROE for Arizona Water.
- Q. DOES THIS COMPLETE YOUR TESTIMONY?
- A. Yes.

THOMAS M. ZEPP

Vice President Utility Resources, Inc.

EDUCATION

University of Florida

Ph.D. Economics M.A. Economics

Wofford College

A.B. Economics (Magna Cum Laude, Phi Beta Kappa)

SELECTED CONSULTING EXPERIENCE

- Finance

Sponsored testimony on the cost of capital faced by electric utilities in court cases and before regulatory commissions in Alaska, Arizona, Idaho, Illinois, Nevada, Oregon, and Washington.

Sponsored testimony on the cost of capital faced by natural gas utilities before regulatory commissions in Illinois, Oregon, Washington and Wyoming.

Sponsored testimony on the cost of capital faced by water utilities before regulatory commissions in Alaska, Arizona, California, Hawaii, Kentucky, Montana, New Mexico, Oregon, and Tennessee.

Estimated costs of capital for Bell Operating Companies and General Telephone local companies in Illinois, Nevada, Oregon and Washington.

Presented estimates of cost of capital of U. S. railroads to the Interstate Commerce Commission.

Estimated cost of capital for a large insurance company.

Presented testimony on the cost of capital of hospitals on behalf of Washington State Hospital Commission.

- Court Proceedings

Expert witness in PPL Montana, Avista Corporation and Pacific Corp vs State of Montana. Testified on behalf of Avista Corporation and was deposed on July 23, 2007.

Expert witness in Umatilla County, Oregon, Circuit Court on the harms to PacifiCorp and benefits to the City of Hermiston of a condemnation of property in the City of Hermiston.

Expert witness in Linn County, Oregon, Circuit Court regarding the harms to an electric utility compared to the benefits of two mills and a People's Utility District of an annexation resulting in a condemnation of electric facilities.

Expert witness in Superior Court of California regarding the value of water company facilities that were made inoperative or otherwise reduced in value after a sanitation district duplicated those facilities.

Expert witness in an Oregon District Court on the present value of economic benefits/harms of transferring hydroelectric plants from Pacific Power & Light Company to a PUD in Oregon.

Rebuttal witness for the Illinois Attorney General in a court appeal on the cost of capital and need for a stay in rates for an electric utility.

Estimated the present value of severance damages resulting from condemnation of a distribution system in California.

Determined the value of facilities to be taken by a City from Strawberry Electric Service District in Utah.

Witness in an Oregon District Court on rates that would have been charged by electric utilities if markets had been more competitive.

Presented an affidavit in Federal Court in Georgia on the cost of service of a municipal water utility.

- Other Studies and Testimonies

Testified on economic principles of regulation before the West Virginia PSC.

Sponsored expert testimony on potential export revenues for BC Hydro to the British Columbia Utility Commission based upon analysis of Canadian and Pacific Northwest hydroelectric records.

Analyzed the costs and benefits of improved efficiency of a BPA system dam based upon the Northwest System Analysis Model and export prices on behalf of Hitachi America.

Presented testimony on the appropriate cost of service methodology to be used to determine electric rates to the Public Utilities Board of the Great Northwest Territories, Canada.

Estimated avoided costs for two Pacific Northwest electric utilities on behalf of the City of Portland, Oregon and Northwest Natural Gas Company.

- Telecommunications and Cable

Prepared a Declaration on appropriate fees for the use of rights of way in Portland, Oregon on behalf of Electric Lightwave, Inc.

Testified on behalf of New Edge and Advanced TelCom Group, Inc. regarding Nevada Bell's proposed nonrecurring charges to be assessed to CLECs for certain loop conditioning activities.

Prepared cost estimates and testified on economic principles and costs of paging on behalf of AirTouch Paging in Colorado and Washington.

Testified on economic principles and costs of wireless service on behalf of AT&T Wireless Services in arbitrations with U S WEST in Colorado, Minnesota, Oregon, and Washington.

Testified on economic principles on behalf of AT&T in arbitrations with GTE in Oklahoma and Oregon.

Testified on behalf of Frontier Telemanagement regarding U S WEST's proposal to withdraw Centrex service after the 1996 Federal Act was passed.

Testified on economic principles and an analysis of U S WEST cost studies on behalf of AT&T Communications and MCI Metro in arbitrations and permanent cost dockets in nine states.

Prepared analyses of local costs of telecommunication service and presented testimony on appropriate rates in Idaho, Nevada, Oregon and Washington.

Sponsored testimony in support of resale of local telecommunications services in California, Iowa, Minnesota, Oregon and Washington.

Presented testimony on the benefits of intraLATA competition in Nebraska.

Presented analyses of private line costs and appropriate rates in Colorado, Idaho, Oregon and Washington.

Estimated costs of local telephone service for a study commissioned by the Oregon legislature.

Reviewed cost studies and negotiated Enhanced 9-1-1 rates with Washington telecommunications companies on behalf of the State of Washington.

Prepared econometric estimates of telephone usage costs and sponsored testimony on appropriate cost-based usage rates.

Sponsored testimony on the appropriate costs and prices for pole attachments in Washington.

PREVIOUS POSITIONS

Zinder Companies, Inc.

Senior Consultant

Oregon Public Utility

Commissioner

Senior Economist

Central Michigan

University

Assistant Professor of Econometrics

Armstrong State College and Savannah State College, the Joint Graduate Program Assistant Professor of Business and

University of Florida

Economics

Instructor

PROFESSIONAL AFFILIATIONS AND ACTIVITIES

Published papers in <u>Water</u>, <u>Financial Management</u>, <u>The Quarterly Review of Economics and Finance and Explorations in Economic History</u>.

Read papers at the Southern Economic Association meetings.

Invited lecturer at Stanford University seminar.

Invited Speaker at the 2002 Pacific NW Regional Economic Conference and at the 57th Annual Western Conference of Public Service Commissioners

Journal Referee for <u>Financial</u> <u>Management</u> and <u>International Review of Economics and Finance</u>

Past Member, NARUC Subcommittee on Economics

TMZ-2

TABLES

Table 1

Past and Current Spreads Between Treasury Rates and Rates for Baa Bonds

A. Past Actual Rates (1990 to 2007)-a/

	30-Year		
	Treasury	Baa	
<u>Year</u>	<u>Rates</u>	<u>Rates</u>	Spread
1990	8.61%	10.36%	1.75%
1991	8.14%	9.80%	1.66%
1992	7.67%	8.98%	1.31%
1993	6.59%	7.93%	1.34%
1994	7.37%	8.63%	1.26%
1995	6.88%	8.20%	1.32%
1996	6.71%	8.05%	1.34%
1997	6.61%	7.87%	1.26%
1998	5.58%	7.22%	1.64%
1999	5.87%	7.88%	2.01%
2000	5.94%	8.37%	2.43%
2001	5.49%	7.95%	2.46%
2002	5.42%	7.80%	2.38%
2003	5.05%	6.76%	1.71%
2004	5.12%	6.39%	1.27%
2005	4.56%	6.06%	1.50%
2006	4.91%	6.48%	1.57%
2007	4.84%	6.48%	1.64%
Average (1990-2007)	6.19%	7.85%	1.66%
2008	4.28%	7.44%	3.16%
2009	4.08%	7.29%	3.21%
Expected spread in 2010-b/			1.80%
	2012 6		
Expected average spread for 2011-	2013-		1.83%

Notes and Sources:

- al Source is Federal Reserve or as implied by rates for 20-year Treasury bonds when 30-year bonds are not available.
- b/ Expected spread derived from October 2010 Blue Chip consensus forecasts of 5.6% for Baa bonds and 3.8% for 30-year Treasury securities for fourth quarter 2010.
- c/ From data in Table 2.

Table 2

Forecasts of Baa Rates and Long-term Treasury Securities Rates
2011 - 2013

	<u> 2011</u>	2012	2013	<u>Average</u>
Long-term Treasury Rates				
Blue Chip Consensus Forecasts-a/	4.50%	5.30%	5.70%	
Value Line-b/	4.40%	5.00%	5.30%	
Average				5.03%
Seasoned Baa Corporate Bonds				
Blue Chip Consensus Forecasts-a/	6.10%	7.00%	7.50%	
Value Line- ^{b/}	na	na	na	
Average				6.87%

Sources and Notes:

a/ Blue Chip long-term long-term consensus forecasts for 2012 and 2013 dated June 2010 and for Fourth Quarter 2011, dated October 2010.

b/ Value Line Quarterly forecasts dated August 27, 2010.

Table 3

Selected Characteristics of the Water Utilities Sample

	Market	Capitalization-a/	(\$ millions)	\$614	43 032	#2,35k	\$2,000 \$705	#187 8187	00-8	\$20¢	\$428	\$1.254	t 107, 0	\$437	ı
ø.															
Measures of Firm Size		Net Plant-a,b/	(\$ millions)	6868	\$9.551	\$2,890	\$1 121	\$281	6340	7 1 0	\$24¢	\$2 239	#1, 1	\$646	\$256
Measure	Operating	Revenues ^{-a/}	(\$ millions)	\$374	\$2.537	\$688	\$455	869	96\$	\$ 2,7 2,7	7 7¢	\$633	7 7 6	424	\$51
	Number of	Customers	_{/q} -(000)	278	3331	953	495	83	96	235	233	782	000	720	84
Percentage	Revenue from	Regulated	Operations-a/	81%	%06	%96	%86	%06	84%	%96	2	91%	7000	0/00	100%
	Common	Equity	Ratio-c/	54%	43%	44%	53%	49%	53%	51%	? -	%09	22%	02.70	51%
	S&P	Bond	Rating-a/	∢	A +	AA-	AA-	∢	⋖	Z	, .	A	◁		I
			Companies in Sample	American States Water	American Water Works Co., Inc.	Aqua America	California Water Service	Connecticut Water Service	Middlesex Water	SJW Corporation		Average	Average for 5 Smallest		Arizona Water ^{-d}

7 2 8 4 5 9 7

Notes and Sources:

_a/ Source: AUS Utility Reports, October 2010 and 2009 10K reports. _b/ Most recent (2009) 10-K Reports or Annual Reports for the various utilities. _c/ From Value Line reports dated October 22, 2010. _d Company data as of year-end 2009.

Table 4

Betas of Utilities in the Water Utilities Sample 2002 and 2010

		Value Line Beta Estimates-a/				
		August	October	Percent		
		2002	<u>2010</u>	Increase		
1	American States Water	0.65	0.80	23%		
2	American Water Works Co	_b/	0.65	na		
3	Aqua America	0.60	0.65	8%		
4	California Water Service	0.60	0.75	25%		
5	Connecticut Water Service	0.45	0.80	78%		
6	Middlesex Water	0.45	0.75	67%		
7	SJW Corporation	0.55	0.95	73%		
	Average	0.55	0.76	46%		

Notes and Sources:

a/ From Value Line editions dated August 2, 2002 and October 22, 2010.

b/ In the process of being acquired. Not a market measure of beta risk.

Table 5

Past Growth Rates for Utilities in the Water Utilities Sample
Average Changes for the Fifteen Year Period Ending in 2009

		Price-a/	BVPS-b/	DPS-b,c/	EPS-b/	Average-c/
1	American States Water	8.3%	4.5%	1.6%	6.3%	6.3%
2	American Water Works Co.,	na	na	na	na	na
3	Aqua America	16.3%	8.5%	7.0%	7.6%	10.8%
4	California Water Service	7.1%	3.9%	1.2%	4.6%	5.2%
5	Connecticut Water Service	7.3%	4.0%	1.4%	4.9%	5.4%
6	Middlesex Water	6.2%	4.3%	2.1%	1.8%	4.1%
7	SJW Corporation	14.4%	6.6%	4.3%	8.4%	9.8%
	Sample Average	9.9%	5.3%	2.9%	5.6%	6.9%

Notes and Sources:

- a/ Average of changes in year-end prices ending in 2009.
- b/ Derived from data in Annual Reports to Stockholders and 10-K Reports for period 1994-2009.
- c/ DPS growth not included in averages. Support for exclusion of DPS growth is the logic stated by the California PUC in Decision 06-08-011.

Table 6

Evidence Showing Risk Increases as the Size of Companies Decrease

1.	Evidence from Morningstar- ^{a/}	Beta Risk	Size Risk Premium	Risk Premium for Companies the Size of Small Water Utilities- ^{e/}
	Mid-Cap Companies ^{_b/}	1.13	1.00%	
	Low-Cap Companies ^{-c/}	1.26	1.64%	
	Micro-Cap Companies-d/	1.51	3.00%	1.36%

2. Evidence Published in Zepp Article-ff

Risk Premium for Small Water Utilities

Estimated risk premium for small water utilities

0.99%

Notes and Sources:

- a/ Data from Table 7-11 of Morningstar 2010 SBBI Valuation Edition Yearbook.
- b/ Companies with market capitalization between \$1,600 million and \$5,936 million included in the Morningstar 2010 study.
- c/ Companies with market capitalization between \$431 million and \$1,600 million. included in the Morningstar 2010 study.
- d/ Companies with market capitalization less than \$431 million included in study.
- e/ Computed as the difference between 3.00% and 1.64%. Does not reflect differences in risk due to differences in betas. Data provided in Table 7-10 of the same study, but based on betas estimated with a different method, indicate a size risk premium of 1.45%.
- f/ From Table 2 in T.M. Zepp, "Utility Stocks and the Size Effect--Revisited," *The Quarterly Review of Economics and Finance*, 43 (2003), 578-582.

Table 7

Current Annualized Average Dividend Yields of Utilities in the Water Utilities Sample

		3-Month Average D _o /P ₀ (a)	6-Month Average D ₀ /P ₀ (b)
1 2	American States Water American Water Works Co., Inc	3.15% 4.03%	3.10% 4.26%
3	Aqua America	2.99%	3.22%
4	California Water Service	3.45%	3.40%
5	Connecticut Water Service	4.19%	4.30%
6	Middlesex Water	4.43%	4.54%
7	SJW Corporation	2.99%	2.84%
	Average	3.60%	3.67%

Source:

_a/ For periods ending October 31, 2010.

Table 8

Comparison of Analysts' Forecasts of Future Growth
With Estimates of Growth Based on Past Growth in

DPS, EPS and Retained Earnings Made by California PUC Staff-al

	Period: 1992 to 1998	Application Number	<u>Date</u>		f Estimates of d on Past Data DPS and EPS Growth	Average of Analysts' Forecasts of Growth	Are Forecasts Comparable to Past Growth?
1	Valencia Water Company	A.92-01-022	June 1992	3.6%	5.9%	3.9%	y e s
2	Dominguez Water Corp	A.92-03-040	June 1992	3.6%	5.9%	4.1%	yes
3	California-American Water	A.92-03-030	July 1992	3.6%	5.9%	4.1%	yes
4	San Gabriel Valley Water	A.92-09-032	April 1993	3.5%	6.0%	4.5%	yes
5	Park Water Company	A.94-03-038	June 1994	2.7%	4.5%	4.2%	yes
6	Valencia Water Company	A.94-04-033	Aug 1994	3.3%	4.5%	4.2%	yes
7	Southern Calif Water	A.95-03-013	July 1995	2.7%	4.6%	3.3%	yes
8	San Gabriel Valley Water	A.95-09-010	Dec 1995	3.6%	4.6%	4.0%	yes
9	California -American Water	A.95-02-016	May 1995	3.0%	4.6%	3.8%	yes
10	California -American Water	A.96-03-008	June 1996	2.8%	3.8%	3.6%	yes
11	Park Water Company	A.97-03-032	August 1997	2.9%	4.5%	3.4%	yes
12	Southern Calif Water	A.98-03-029	July 1998	2.7%	4.6%	3.6%	yes
	Period: 2000 to 2007						
1	Park Water	A.00-03-022	July 2000	2.5%	4.8%	5.2%	no
2	California Water Servioce	A.01-09-062	March 2002	3.1%	4.2%	6.3%	no
3	Park Water	A.02-03-046	July 2002	3.3%	2.9%	5.4%	no
4	Valencia Water Company	A.02-05-013	Sept 2002	3.4%	2.9%	6.5%	no
5	California-American Water	A.02-09-030	March 2003	3.1%	2.4%	6.2%	no
6	Southern Calif Water	A.02-11-007	April 2003	3.1%	2.4%	5.6%	no
7	San Gabriel Valley Water	A.02-11-044	July 2003	3.0%	3.3%	6.2%	no
8	San Jose Water	A-03-05-035	November 2003	3.0%	3.3%	6.1%	no
9	California -American Water	A.03-07-036	January 2004	2.9%	3.4%	6.3%	no
10	California -American Water	A.04-03-023	July 2004	2.9%	2.8%	6.7%	no
11	California-American Water	A.04-04-040	November 2004	2.8%	2.9%	7.0%	no
12	Suburban Water System	A.05-08-034	November 2005	2.8%	4.2%	8.3%	no
13	San Jose Water	A.06-02-014	June 2006	2.4%	3.7%	7.9%	no
14	Golden State Water	A.07-01-009	May 2007	3.1%	5.0%	8.9%	no

Notes and Sources:

a/ All growth rates are growth rates based on data reported in Califronia PUC Staff Cost of Capital Reports.

Table 9

Analysts' Forecasts of Growth for DCF Model

			Yahoo!		Value	
		Zack's-a/	Finance-al	Reuters-a/	Line-b/	<u>Average</u>
1	American States Water	7.5%	6.3%	6.3%	8.0%	7.0%
2	American Water Works Co., Inc.	8.9%	10.5%	10.9%	7.0%	9.3%
3	Aqua America	6.0%	6.7%	7.3%	11.0%	7.7%
4	California Water Service	4.0%	8.7%	8.7%	6.0%	6.9%
5	Connecticut Water Service	_c/	15.0%	8.0%	_c/	11.5%
6	Middlesex Water	_c/	8.0%	nmf	_c/	8.0%
7	SJW Corporation	_c/	14.0%	nmf	_c/	14.0%
	Simple Average					9.2%
	Weighted Average					8.4%

Sources and Notes:

- a/ Reported on the Internet, November 3, 2010.
- b/ Reported by Value Line October 22, 2010. Forecast for American Water Works is derived from Value Line's forecast of EPS for 2014.
- c/ Analysts' consenus forecasts are not available at this time.

Table 10

DCF Estimates Based on Data for the Water Utilites Sample and Conceptually Correct Growth Rate Estimates

3-Month Average Current Yield ^{-a/}		3.60%	_a/	
Growth Rate		8.43%	_b/	
Expected Yield		3.91%	_c/	
ROE		12.3%	_d/	
			a.l	
6-Month Average Current Yield- ^{a/}		3.67%	_a/	
Growth Rate		8.43%	_b/	
Expected Yield		3.98%	_c/	
ROE		12.4%	_d/	
Benchmark Range of ROE Estimates				
for the Water Utilities Sample	12.3%	to	,	12.4%

Notes and Sources:

- a/ The 3-month and 6-month yields reported in Table 7. time value of money.
- b/ Reported in Table 9. To be conservative, the smaller of the simple average or the weighted average.
- c/ Expected yield = $D_1/P_0 = D_0/P_0$ * (1 + g).
- $d/ROE = D_1/P_0 + g$

Table 11

DCF Estimates Based on Data for the Water Utilites Sample Conservative Estimates of Growth Rates^{-e/}

3-Month Average Current Yield-a/		3.60%	_a/	
Growth Rate-b		7.69%	_b/	
Expected Yield		3.88%	_c/	
ROE		11.6%	_d/	
12-Month Average Current Yield- ^{a/}		3.67%	_a/	
Growth Rate-b/		7.69%	_b/	
Expected Yield		3.95%	_c/	
ROE		11.6%	_d/	
Benchmark Range of ROE Estimates				
for the Water Utilities Sample	11.6%	to	11.6	%

Notes and Sources:

- a/ The 3-month and 6-month yields reported in Table 7.
- b/ Average of past growth from Table 5 and weighted-forecast of growth from Table 9.
- c/ Expected yield = $D_1/P_0 = D_0/P_0 * (1 + g)$.
- $d/ROE = D_1/P_0 + g$

Table 12

Cost of Equity for Water Utilities Sample Based on the Traditional Capital Asset Pricing Model and Long-Horizon Market Risk Premium

Risk Free Rate- ^{a/}	5.03%
Beta- ^{b/}	0.76
Market Risk Premium-c/	6.7%
Cost of Equity for the Water Utilities Sample	10.2%
Indicated Cost of Equity for Arizona Water	10.7%

Sources and Notes:

- a/ Source is Table 2.
- b/ Source is Table 4.
- c/ Morningstar estimate of MRP reported in Table 5-2 of Ibbotson SBBI 2010 Valuation Yearbook.

Table 13

Cost of Equity for Water Utilities Sample Based on the Traditional Capital Asset Pricing Model and Recent Market Risk Premium

Risk Free Rate-al	5.03%
Beta- ^ы	0.76
Market Risk Premium-⁰	9.4%
Cost of Equity for the Water Utilities Sample	12.2%
Indicated Cost of Equity for Arizona Water	12.7%

Sources and Notes:

a/ Source is Table 2.

b/ Source is Table 4.

c/ Source is the 5-year average developed in Table 15.

Table 14

ACC Staff Method: Implied Market Risk Premium Derived from Value Line Forecasts Presented in Weekly Summary & Index Report

Estimated Appreciation Potential for 1700 Stocks During the Next 3 to 5 Years ^{-a/}	60%
Indicated Annual Appreciation	12.5%
Expected Dividend Yield-a/	2.1%
Expected Return for 1700 Stocks E(R _M)	14.6%
Expected RF-b/	5.1%
Estimate of MRP $[E(R_M) - RF]$	9.5%

Notes and Sources:

a/ From Value Line Summary and Index, cover page dated October 29, 2010.

b/ From Table 2.

Table 15

Determination of Average Risk Premiums Based on DCF Analyses of the Value Line Industrial Composite: 1984 to 2010

			Average of Forecasted	DCF	Long-term	
	Study	Dividend	EPS and BR	Equity	Treasury	Risk
	Date	Yield	Growth	Cost	Lag 1 Mnth	Premium
1	1/84	4.00%	9.32%	13.32%	11.88%	1.44%
2	1/85	3.80%	12.06%	15.86%	11.52%	4.34%
3	1/86	3.80%	10.11%	13.91%	9.54%	4.37%
4	2/87	3.00%	9.48%	12.48%	7.39%	5.09%
5	2/88	3.10%	11.25%	14.35%	8.83%	5.52%
6	7/88	3.50%	8.26%	11.76%	9.00%	2.76%
7	2/89	3.50%	10.01%	13.51%	8.93%	4.58%
8	2/90	3.20%	7.88%	11.08%	8.26%	2.82%
9	1/91	3.70%	9.08%	12.78%	8.24%	4.54%
10	2/92	2.80%	10.06%	12.86%	7.58%	5.28%
11	2/93	2.90%	7.69%	10.59%	7.34%	3.25%
12	2/94	3.00%	10.87%	13.87%	6.39%	7.48%
13	2/95	2.70%	11.25%	13.95%	7.97%	5.98%
14	3/96	2.70%	12.49%	15.19%	6.03%	9.16%
15	2/97	2.40%	11.96%	14.36%	6.91%	7.45%
16	1/98	1.50%	12.95%	14.45%	6.07%	8.38%
17	1/99	1.30%	13.81%	15.11%	5.36%	9.75%
18	2/00	0.80%	12.58%	13.38%	6.86%	6.52%
19	7/00	1.00%	12.49%	13.49%	6.28%	7.21%
20	2/01	1.20%	10.76%	11.96%	5.65%	6.31%
21	7/01	1.20%	10.07%	11.27%	5.82%	5.45%
22	1/02	1.20%	8.96%	10.16%	5.76%	4.40%
23	8/02	1.60%	7.85%	9.45%	5.51%	3.94%
24	1/03	1.60%	7.41%	9.01%	5.01%	4.00%
25	7/03	1.50%	9.92%	11.42%	4.34%	7.08%
26	3/04	1.60%	9.27%	10.87%	4.94%	5.93%
27	10/04	1.80%	9.57%	11.37%	4.89%	6.48%
28	4/05	1.90%	8.95%	10.85%	4.89%	5.96%
29	11/05	2.10%	11.03%	13.13%	4.74%	8.39%
30	5/06	2.10%	9.28%	11.38%	5.22%	6.16%
31	11/06	2.20%	12.03%	14.23%	4.94%	9.29%
32	5/07	2.50%	11.13%	13.63%	4.87%	8.76%
33	11/07	1.60%	11.93%	13.53%	4.77%	8.76%
34	5/08	1.80%	14.08%	15.88%	4.44%	11.44%
35	11/08	2.80%	11.89%	14.69%	4.17%	10.52%
36	5/09	2.80%	12.70%	15.50%	3.76%	11.74%
37	11/09	2,40%	11.22%	13.62%	4.19%	9.43%
38	8/10	2.00%	10.24%	12.24%	3.99%	8.25%

Averages for:

All years (1987-2010) 6.5% Last 5 years (2006-2010) 9.4%

Table 16

Check on CAPM: Risk Premium Analysis Using Authorized Returns on Equity As Surrogates for the Costs of Equity for the Water Utilities Sample 2000 - 2009

	Authorized	30-Year	
	Returns on	Treasury	Risk
	Equity- ^{a/}	Rates ^{_b/}	Premiums
2000	11.13%	5.94%	5.19%
2001	10.89%	5.49%	5.40%
2002	10.67%	5.42%	5.25%
2003	10.67%	5.05%	5.62%
2004	10.48%	5.12%	5.36%
2005	10.48%	4.56%	5.92%
2006	10.47%	4.91%	5.56%
2007	10.45%	4.84%	5.61%
2008	10.11%	4.28%	5.83%
2009	10.11%	4.08%	6.03%
	10-Year Average Premium	4.97%	5.58%
	5-year Average Premium	4.53%	5.79%
	Average of forecasted interest	rates for 2011-2013- ^{c/}	5.03%
	Projected Returns on Equity		
	10-Year Average		10.6%
	5-Year Average		10.8%

Notes and Sources:

a/ Average of ROEs authorized at beginning of the indicated year as reported by AUS (formerly CA Turner) Utility Reports for various years for the water utilities sample.

b/ Reported by Federal Reserve or implied from 20-year Treasury rates .

c/ Source is Table 2.

Table 17

Check on CAPM: Risk Premium Analyis Based on Averages of Annual DCF Equity Cost Estimates 2000 - 2009

DCF	Estimates	of	Cost o	f	Fauity-a/

_	باا	or Estimates	of Cost of Equity-			
	Current	Average	DCF	Equity	30-Year	
	Dividend	Growth	Dividend	Cost	Treasury	Risk
	Yield-b/	<u>Estimate</u>	Yield (D ₁ /P ₀)- $^{c/}$	<u>Estimate</u>	Rates- ^b	Premiums
2000	3.44%	6.63%	3.66%	10.29%	5.94%	4.35%
2001	3.38%	6.26%	3.59%	9.85%	5.49%	4.36%
2002	3.23%	6.55%	3.44%	9.99%	5.42%	4.57%
2003	3.43%	6.13%	3.64%	9.7 7 %	5.05%	4.72%
2004	3.20%	7.44%	3.44%	10.88%	5.12%	5.76%
2005	2.87%	7.94%	3.09%	11.03%	4.56%	6.47%
2006	2.71%	8.03%	2.93%	10.95%	4.91%	6.04%
2007	2.73%	8.67%	2.97%	11.64%	4.84%	6.80%
2008	3.03%	9.45%	3.31%	12.76%	4.28%	8.48%
2009	3.51%	8.51%	3.81%	12.32%	4.08%	8.24%
			10-Year Average	Premium		5.98%
			5-year Average F	Premium		7.21%
			Average of forec	asted Treasury	rates- ^{d/}	5.03%
			Projected Return	is on Fauity		
			•	0-Year Average	2	11.0%
				-Year Average	•	12,2%

Notes and Sources:

_a/ Derived from data for utilities in the water utilities sample. Growth rates are averages of available forecasts made by analysts and Value Line.

b/ Current dividend yields (D₀/P₀) are annual averages.

_c/ Expected yield = $D_1/P_0 = D_0/P_0$ * (1 + g).

_d/ Source is Table 2.

Table 18

California Division of Ratepayer Advocates Staff Company-Specific Risk Analysis Applied to Arizona Water Comparison to California Class A Water Utilities

								TEST #1 Average		TES1 #2
California Class A Water Utilites-							5-Year	Over (Under)	Standard	Coeff, Of
		2004	2005	2006	2007	2008	Average	Performance	Deviation	Variation
Suburban Waler System-b	Earned ROE	16.91%	17.74%	18.10%	19.16%	19.37%	18.26%	8.35%	1.02%	0.06
Response to VCC-1-8 (2003-2007)	Authorized ROE	9.84%	9.84%	9.84%	10,00%	10.00%	9.90%			
San Jose Water Company	Earned ROE	8,93%	7.97%	9.70%	10.33%	9.68%	9.32%	-0.67%	0.91%	0.10
Response to DRA-I-8 (2004-2008)	Authorized ROE	9.90%	9.90%	9.90%	10.13%	10,13%	9,99%		0.5 ()	0.10
San Gabriel Valley Water Company	Earned ROE	10,92%	14.24%	11.25%	8.66%	11.41%	11.30%	1.22%	1.99%	0.18
Response to DRA-1-8 (2004-2008)	Authorized ROE	10.10%	10.10%	10.00%	10.00%	10,20%	10.08%			
Park Water Company	Earned ROE	9.42%	8.61%	11.55%	9.69%	6.03%	9.06%	-1.09%	2.01%	0.22
Response to DRA-1-8 (2004-2008)	Authorized ROE	10.13%	10,13%	10.15%	10.18%	10.18%	10.15%			
1										
Valencia Water Company	Earned ROE	8.87%	5.26%	7.85%	12.51%	8.80%	8.66%	-t.25%	2.60%	0.30
Response to DRA-1-8 (2004-2008)	Authorized ROE	9,72%	9,72%	9.72%	10.19%	10.19%	9.91%			
					Adjusted Avg-b/	Earned ROE	9.58%	-0.45%		
					Adjusted Avg-tv	Authorized ROE	10.03%		Average CV	0.20
							5-Year			
		2005	2006	2007	2008	2009	Average	TEST #1	···	TEST #2
Arizona Water	Earned RQE	8.84%	9,06%	5.46%	4.22%	4.25%	6,37%	-3.04%	2.41%	88.0
	Authorized ROE	9.41%	9.41%	9.41%	9.41%	9.41%	9.41%			
Relative Risk of Arizona Water Com	pared to Relative Risk	t of the Class A wa	oler utitlies					6.8		1.9
Relative Risk of Arizona Water Com	pared to Relative Risk	of Valencia Wate	r Company					2.4		1.3
Risk Premium for Arizona Water inc	ficated by California D	RA Staff Analysis						61		32

Notes and Sources:

a/ Attachment JRW-13, Exhibit DRA-1, CPUC Application 09-05-001, et. al.

b/ To be conservative, Suburban Water is not included in averages.

c/ Comparable five years of data used for Arizona Water.

Arizona Water Company

Table 19

California Division of Ratepayer Advocates Staff Company-Specific Risk Analysis Applied to Arizona Water Comparison to Water Utilities Sample Adopted to Determine Benchmark Cost of Equity Estimates

WAS CLUMBER OF STREET								TEST #1 Average		TEST #2
vater Onnes Sample		2005	2006	2007	2008	2009	5-Year Average	Over (Under) Performance	Standard Deviation	Coeff. Of Variation
American States Water	Earned ROE Authorized ROE	10.40% 10.00%	8.40% 9.87%	9.30%	7.20%	8.82% 10.50%	8.82%	-1.29%	1.18%	0.13
Aqua America, Inc.	Earned ROE Authorized ROE	11.50%	11.00%	10.00%	9.60%	9.60%	10,34%	0.21%	0.86%	0.08
California Water Service Group	Eamed ROE Authorized ROE	9.30%	8.40%	4.90%	10.10%	9.80%	8.50% 10.16%	-1.66%	2.11%	0.25
Connecticut Water Services, Inc. Earned ROE Authorized ROI	Earned ROE Authorized ROE	12.00%	4.20%	8.90%	9.20%	9.78%	8.82% 11.16%	-2.34%	2.85%	0.32
Middlesex Water Company	Earned ROE Authorized ROE	8.40%	10.00%	8.80%	8.80%	7.04% 10.00%	8.61% 10.02%	-1.41%	1.06%	0.12
SJW Corp.	Earned ROE Authorized ROE	11.50% 9.90%	18.20%	8.30%	11.20%	5.98%	11.04%	%96.0	4.60%	0.42
					Average Average	Earned ROE Authorized ROE	9.35%	%26.0-	Average CV	0.22
	Ì	2005	2006	2007	2008	2009	5-Year Average	TEST #1		TEST #2
Arizona Water- ^{e/}	Earned ROE Authorized ROE	8.84% 9.41%	9.06%	5.46%	4.22%	4.25% 9.41%	6.37%	-3.04%	2.41%	0.38
Relative Risk of Arizona Water Compared to Relative Risk of	Compared to Relati		Water Utilties Sample					3.3		17

1.7

3.3

al Attachment JRW-13, Exhibit DRA-1. CPUC Application 09-05-001. et. al. for data through 2008. Data for 2009 from AUS Utility Reports and SEC 10 K's. bl. American Water Works not included due to lack of data. Pennichuck and Southwest Water were in outside expert's sample. They are not included by Arizona Corporation Commission Staff in an appropriate water utilities s+A18ample.

Table 20 Summary Table: Estimated Costs of Equity for Arizona Water Company

	Estimates of Benchmark Cost of Equity for Water Utilities Sample				Estimates of the Cost of Equity for Arizona Water ^{-a/}			
DCF Estimates								
DCF analysis Table 10	12.3%	to	12.4%	12.8%	to	12.9%		
DCF analysis Table 11	11.6%	to	11.6%	12.1%	to	12.1%		
DCF Average		12.0%			12.5%]		
CAPM Estimates								
CAPM Table 12		10.2%			10.7%			
CAPM Table 13		12.2%			12.7%			
CAPM Average	[11.2%			11.7%]		
Risk Premium Checks on CAPM Estimates								
Check on CAPM Table 16	10.6%	to	10.8%	11.1%	to	11.3%		
Check on CAPM Table 17	11.0%	to	12.2%	11.5%	to	12.7%		
Range of checks on CAPM	10.6%	to	12.2%	11.1%	to	12.7%		
Range of Cost of Equity Estimates-b/	10.9%	to	12.3%	11.4%	to	12.8%		
Recommended ROE					12.1%]		

Notes:

a/ Arizona Water cost of equity estimates include a 50 basis point risk premium.

b/ Cost of Equity determined with Staff method of giving equal weight to DCF and CAPM estimates.